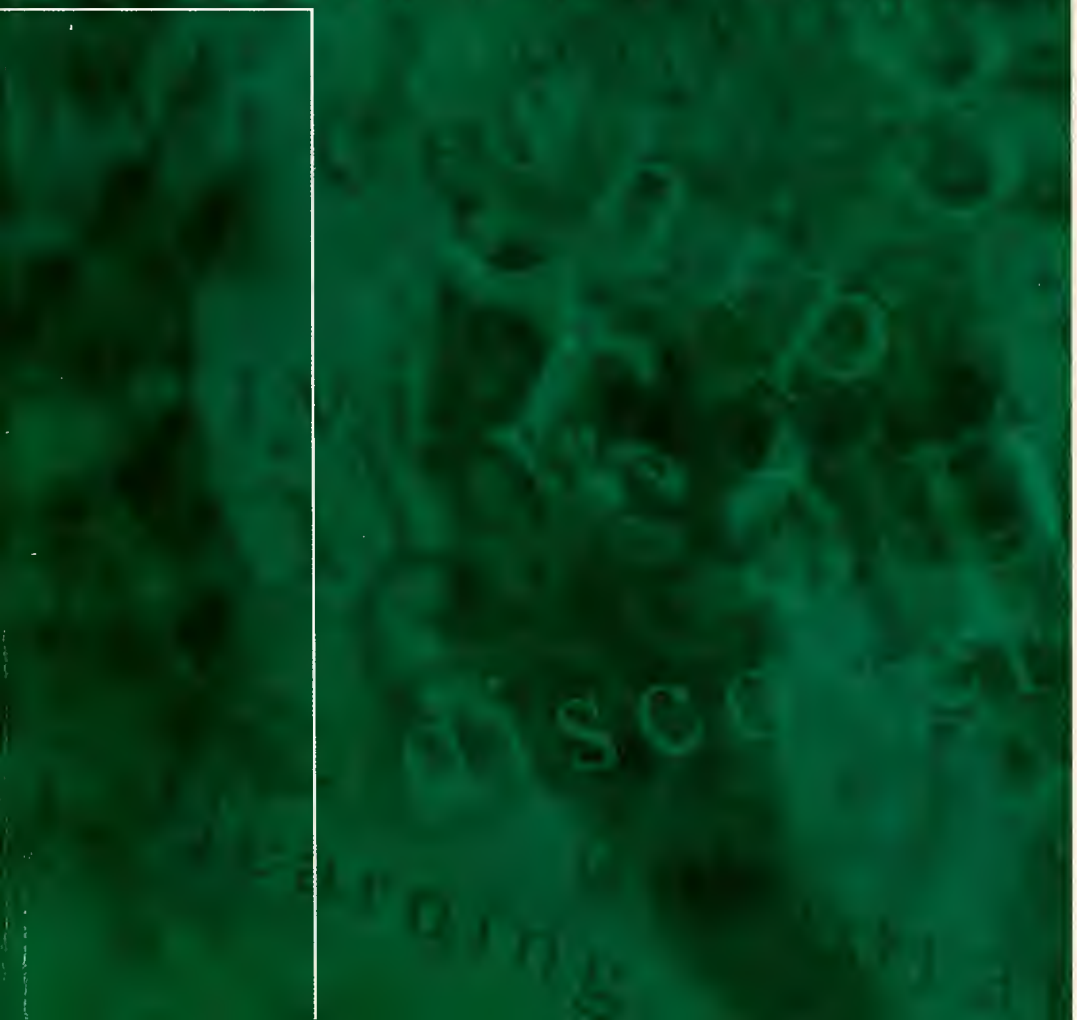
Graduate Catalog 2000-2002

THE GRADUATE SCHOOL OF THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE

UNC CHARLOTTE
GRADUATE SCHOOL



Correspondence Directory

If, after reading this *Catalog*, you have further questions or specific inquiries about the programs of, or admission to, The University of North Carolina at Charlotte, please look below to find the proper office to contact. Address correspondence to any of the offices in care of:

The University of North Carolina at Charlotte
9201 University City Boulevard
Charlotte, North Carolina 28223-0001

NOTE ON TELEPHONE NUMBERS CHANGING:
Effective July 1, 2000, the exchanges on ALL University telephone numbers will change to 687. Until that time, please use the current exchanges listed in this catalog.

Also, after July 1, callers will need to use 10-digit dialing when calling any University number from a non-University phone line.

Numbers below are effective July 1, 2000. Until then, dial (704) 547-extention. After July 1, 10-digit dialing takes effect.

INFORMATION
Campus Operator.....(704) 687-2000

Academic Affairs.....(704) 687-2224
Admissions
Graduate.....(704) 687-3366
International.....(704) 687-2694
Undergraduate.....(704) 687-2213

Brocker Health Center.....(704) 687-4617
College of
Architecture.....(704) 687-2358
Arts & Sciences.....(704) 687-4303
Business Administration.....(704) 687-2165
Education.....(704) 687-4707
Engineering.....(704) 687-2301
Information Technology.....(704) 687-3119
Nursing and Health Professions.....(704) 687-4650
Cone University Center.....(704) 687-2267
Continuing Education and Extension..(704) 687-2424
Cooperative Education.....(704) 687-2361
Counseling Center.....(704) 687-2105
Dean of Students.....(704) 687-2375
Financial Aid.....(704) 687-2461
Graduate School
Admissions.....(704) 687-3366
Dean's Office.....(704) 687-3371
Housing and Residence Life.....(704) 687-2585
International Admissions.....(704) 687-2694
International Programs.....(704) 687-2407
J. Murrey Atkins Library
Circulation.....(704) 687-2392
Reference.....(704) 687-2241
Records/Registration.....(704) 687-3487
Student Affairs.....(704) 687-2206
Summer Programs.....(704) 687-2424

EMERGENCY NUMBERS
Campus Police –
Emergency.....911 (on campus)
687-2200 (off campus)
Director of Public Safety
and Non-Emergency Calls.....(704) 687-2282
Health Services
(radio contact with police).....(704) 687-4617

About This Catalog:

Although the publisher of this catalog has made every reasonable effort to attain factual accuracy herein, no responsibility is assumed for editorial, clerical or printing errors, or errors occasioned by mistakes. The publisher has attempted to present information that, at the time of preparation for printing, most accurately describes the course offerings, faculty listings, policies, procedures, regulations and requirements of the University. However, it does not establish contractual relations. The University reserves the right to alter or change any statement contained herein without prior notice.

Graduation Rate Disclosure Statement
Our data show that 54% of the full-time new freshmen who entered UNC Charlotte in Fall 1993 have received a baccalaureate from this institution or another UNC institution as of Fall 1999. In addition, another 6% were enrolled at this or another UNC institution in pursuit of their baccalaureate degree as of Fall 1999. This information is provided pursuant to requirements of the Student-Right-to-Know and Campus Security Act of 1990.

Published by the Graduate School, June 2000.

Cover Design by Steve Thomas Marketing Communications and the UNC Charlotte Graduate School.

20,000 copies of this public document were printed at a cost of $23,002.40 or $1.15 per copy

UNCCHARLOTTE

The University of North Carolina at Charlotte

The University of North Carolina at Charlotte

Graduate Catalog 2000-2002

Vol. I, No. I

Available electronically at
http://www.uncc/edu/gradmiss/grad_cat

The University of North Carolina at Charlotte is open to people of all races and is committed to equality of educational opportunity and does not discriminate against applicants, students, or employees based on race, color, national origin, religion, sex, sexual orientation, age, or disability.

Academic Calendar 2000-2002

Dates pertaining to changes in enrollment and refunds are included in the calendars that appear in the *Schedule of Classes* each semester and in the summer sessions bulletin.

FALL SEMESTER, 2000

Academic year begins	Monday, August 14
Graduate New Student Orientation	Thursday-Saturday, August 17-19
First class day	Monday, August 21
Labor Day (no classes)(University closed)	Monday, September 4
Student recess (no classes)	Monday, October 9
Thanksgiving recess (no classes)	Wednesday-Friday, November 22-24
Last class day	Friday, December 8
Final examinations	Saturday, December 9, Monday-Friday, December 11-15
Commencement	Saturday, December 16

SPRING SEMESTER, 2001

Graduate New Student Orientation	Monday, January 8
First class day	Wednesday, January 10
Martin Luther King Day (no classes)(University closed)	Monday, January 15
Spring recess (no classes)	Monday-Friday, March 5-9
Last class day	Wednesday, May 2
Final examinations	Thursday-Saturday, May 3-5, Monday-Wednesday, May 7-9
Commencement	Saturday, May 12
Academic year ends	Saturday, May 12

FIRST SUMMER TERM, 2001

Registration	Monday, May 21
First class day	Tuesday, May 22
Last class day	Monday, June 25
Final examinations	Tuesday-Wednesday, June 26-27

SECOND SUMMER TERM, 2001

Registration	Wednesday, June 27
First class day	Thursday, June 28
Fourth of July (no classes)(University closed)	Wednesday, July 4
Last class day	Thursday, August 2
Final examinations	Friday, August 3, Monday, August 6

FALL SEMESTER, 2001

Academic year begins	Tuesday, August 14
Graduate New Student Orientation	Thursday-Saturday, August 16-18
First class day	Monday, August 20
Labor Day (no classes)(University closed)	Monday, September 3
Fall recess (no classes)	Friday, October 12
Thanksgiving recess (no classes)	Wednesday-Friday, November 21-23
Last class day	Friday, December 7
Final examinations	Saturday, December 8, Monday-Friday, December 10-14
Commencement	Saturday, December 15

SPRING SEMESTER, 2002

Graduate New Student Orientation	Monday, January 7
First class day	Wednesday, January 9
Martin Luther King Day (no classes)(University closed)	Monday, January 21
Spring recess (no classes)	Monday-Friday, March 4-8
Last class day	Wednesday, May 1
Final examinations	Thursday-Saturday, May 2-4, Monday-Wednesday May 6-8
Commencement	Saturday, May 11
Academic year ends	Monday, May 13

FIRST SUMMER TERM, 2002

Registration	Wednesday, May 22
First class day	Thursday, May 23
Last class day	Wednesday, June 26
Final examinations	Thursday-Friday, June 27-28

SECOND SUMMER TERM, 2002

Registration	Friday, June 28
First class day	Monday, July 1
Fourth of July (no classes)(University closed)	Thursday-Friday, July 4-5
Last class day	Tuesday, August 6
Final examinations	Wednesday-Thursday, August 7-8

All dates from the Academic Affairs *Five-Year Academic Calendar*, approved 2/21/2000

Table of Contents

Academic Calendar 2
The University 4
The Graduate School 7
History and Organization 7
Graduate Student Life 9
Admission to the Graduate School 9
Financial Information 14
Tuition and Fees 15
Financial Aid 18
Academic Regulations and Degree Requirements 21
Masters Degree Requirements 26
Ph.D. 27
Ed.D. 28
Graduate Certificate Requirements 29

Graduate Programs
Accounting, M.ACC 31
Architecture, M.ARCH 33
Biology, M.S., M.A, Ph.D. 36
Business Administration, M.B.A. and
M.B.A. Plus Certificate 42
Chemistry, M.S. 49
Communication, Certificate. 53
Computer Science, M.S. 54
Advanced Databases and
Knowledge Discovery, Certificate 55
Counseling, M.A. 60
Criminal Justice, M.S. 63
Economics, M. 65
Education
Child & Family Studies, M.Ed. 69
Curriculum and Supervision, M.Ed. 72
Educational Administration, M.S.A., Ed.D. 74
Elementary Education, M.Ed. 80
Instructional Systems Technology, M.Ed. 81
Middle Grades
and Secondary Education, M.Ed. 83
Reading Education, M.Ed. 86
Special Education, M. Ed. 88
Academically Gifted or Intellectually
Gifted, Certificate 89
Special Education, Certificate 90-93
Supported Employment and Transition, Cert. ... 93
Teaching English as a Second Language, M.Ed. 96
Engineering
Civil Engineering, M.S.E., M.S.C.E., Ph.D. 98
Electrical Engineering, M.S.E., M.S.E.E, Ph.D. 105
Mechanical Engineering, M.S.E., M.S.M.E., Ph.D. 114
Engineering Management, M.S. 125
English, M.A. 127
English Education, M.A. 129
English Language Studies, Certificate 130
Technical/Professional Writing, Certificate 130
Geography, M.A. 135
Gerontology, M.A., Certificate 144
Health Administration, M.H.A. 146
Health Promotion, M.S. 149
History, M.A., Ph.D. 153
Information Technology, M.S. , Ph.D., Certificate 156
Liberal Studies, M.A 164
Mathematics, M.S., Ph.D. 166
Mathematics Education, M.A. 169
Nursing 177
M.S.N. 178
Adult Health Nursing, M.S.N. 179
Community Health Nursing,, M.S.N 180
Family Nurse Practitioner, M.S.N. 181
Psychiatric Mental Health Nursing, M.S.N. 182
Nurse Anesthesia, M.S.N. 183
Nursing/Health Administration, M.S.N./M.H.A. . 184
Operations Research, Minor 189
Physics, M.S., Ph.D. 190
Psychology 193
Clinical/Community, M.A. 194
Industrial/Organizational, M.A. 195
Public Administration, M.P.A. 199
Social Work, M.S.W. 204
Sociology, M.A. 206
General Graduate Course Descriptions 210

Programs, Services and Facilities 218
Educational Services and Facilities 218
Student Affairs and Services 222
Student Activities 224
Campus Services 226
University and the Community 227
Other University Services 229
University Regulation of Student Conduct 230
Code of Student Academic Integrity 230
Code of Student Responsibility 230
Program to Prevent Use of Illegal Drugs
and Alcohol Abuse 231
Harassment Policies 231
Immunization Requirements 232
Directory 234
Index 259
Campus Map ..... inside back cover

THE UNIVERSITY

HISTORY OF THE UNIVERSITY OF NORTH CAROLINA

In North Carolina, all public educational institutions that grant baccalaureate degrees are part of the University of North Carolina. The University of North Carolina at Charlotte is one of the 16 constituent institutions of the multi-campus state university.

The University of North Carolina, chartered by the N.C. General Assembly in 1789, was the first public university in the United States to open its doors and the only one to graduate students in the eighteenth century. The first class was admitted in Chapel Hill in 1795. For the next 136 years, the only campus of the University of North Carolina was at Chapel Hill.

In 1877, the N.C. General Assembly began sponsoring additional institutions of higher education, diverse in origin and purpose. Five were historically black institutions, and another was founded to educate American Indians. Several were created to prepare teachers for the public schools. Others had a technological emphasis. One is a training school for performing artists.

In 1931, the N.C. General Assembly redefined the University of North Carolina to include three state-supported institutions: the campus at Chapel Hill (now the University of North Carolina at Chapel Hill), North Carolina State College (now North Carolina State University at Raleigh), and Woman's College (now the University of North Carolina at Greensboro). The new multi-campus University operated with one board of trustees and one president. By 1969, three additional campuses had joined the University through legislative action: the University of North Carolina at Charlotte, the University of North Carolina at Asheville, and the University of North Carolina at Wilmington.

In 1971, the General Assembly passed legislation bringing into the University of North Carolina the state's ten remaining public senior institutions, each of which had until then been legally separate: Appalachian State University, East Carolina University, Elizabeth City State University, Fayetteville State University, North Carolina Agricultural and Technical State University, North Carolina Central University, the North Carolina School of the Arts, Pembroke State University (now the University of North Carolina at Pembroke), Western Carolina University, and Winston-Salem State University. This action created the current 16-campus University. (In 1985, the North Carolina School of Science and Mathematics, a residential high school for gifted students, was declared an affiliated school of the University.)

The UNC Board of Governors is the policy-making body legally charged with "the general determination, control, supervision, management, and governance of all affairs of the constituent institutions." It elects the president, who administers the University. The 32 voting members of the Board of Governors are elected by the General Assembly for four-year terms. Former board chairmen and board members who are former governors of North Carolina may continue to serve for limited periods as non-voting members emeriti. The president of the UNC Association of Student Governments, or that student's designee, is also a non-voting member.

Each of the 16 constituent institutions is headed by a chancellor, who is chosen by the Board of Governors on the president's nomination and is responsible to the president. Each institution has a board of trustees, consisting of eight members elected by the Board of Governors, four appointed by the governor, and the president of the student body, who serves ex-officio. (The NC School of the Arts has two additional ex-officio members.) Each board of trustees holds extensive powers over academic and other operations of its institution on delegation from the Board of Governors.

THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE

UNC Charlotte aspires to be North Carolina's most energetic and responsive university, offering unparalleled educational opportunities for students seeking the highest quality undergraduate, graduate, and continuing personal or professional enrichment in the liberal arts and sciences and selected professions. With an enrollment of more than 16,000 students in its academic programs and approximately 4,000 students residing on the campus, UNC Charlotte attracts a diverse student body from 44 states and 65 foreign countries.

The University offers a comprehensive array of baccalaureate and master's programs and selected opportunities for doctoral education designed to serve the educational needs of the citizens of North Carolina. In addition, it has one of the most active international studies programs in the country for an institution of its size. A number of programs, including graduate studies, are offered in the evening, on weekends, and at UNC Charlotte Uptown, a classroom facility in the heart of Charlotte.

UNC Charlotte is known for its "student-centered" approach to education featuring outstanding faculty in classes of moderate size. The University's goal is to help every student capable of completing college-level work to learn to the maximum of their ability and to be successful in their chosen field of study. UNC Charlotte also is gaining national and international recognition for the research and scholarship of its faculty and for its willingness to collaborate with other institutions to

address the major educational, economic, social, and cultural needs of the greater Charlotte region.

Despite its location in a metropolitan area of more than 1.5 million people, the campus includes approximately one thousand acres of rolling hills with forests, streams, and ponds, surrounding a pedestrian core of contemporary air-conditioned buildings that has the feel of a small residential campus. Easily accessed by nearby interstate highways and an international airport, the campus is enhanced by University City, a planned community comprising University Place, University Research Park, and University Hospital, adjacent to the campus.

Institutional Mission Statement

UNC Charlotte is the public university of the Charlotte region, fully engaged in the discovery, dissemination, synthesis, and application of knowledge. It provides for the educational, economic, social, and cultural advancement of the people of North Carolina through on- and off-campus programs, continuing personal and professional education opportunities, research, and collaborative relationships with the private, public, and nonprofit institutional resources of the greater Charlotte metropolitan region.

The primary commitment of UNC Charlotte is to extend educational opportunities and to ensure success for qualified students of diverse backgrounds through informed and effective teaching in the liberal arts and sciences and in selected professional programs offered through colleges of Architecture, Arts and Sciences, Business Administration, Education, Engineering, Information Technology, and Nursing and Health Professions, and through programs and services designed to support students' intellectual and personal development.

With a broad institutional commitment to liberal education as the foundation for constructive citizenship, professional practice, and lifelong learning, UNC Charlotte is prepared to focus interdisciplinary resources to address six broad areas of concern to the region comprising the ten North Carolina and three South Carolina counties that surround Charlotte: 1) Business and Finance; 2) Community and Regional Development; 3) Children, Families, and Schools; 4) Health Care and Health Policy; 5) International Understanding and Involvement; and 6) Applied Sciences and Technologies.

Equal Opportunity and Affirmative Action

The University of North Carolina at Charlotte is dedicated to equal opportunity through affirmative action within the University community. The University's affirmative action program is designed to provide equal consideration of all applicants for faculty and staff positions, for all faculty members in the tenure and promotion process, for administrators and other staff members seeking promotions and upgrades, as well as for students seeking admission, financial aid, and equality in academic and athletic programs.

In keeping with this policy, faculty and staff are recruited, hired, and promoted without regard to race, color, religion, sex, national origin, age, sexual orientation, or any non-relevant disability. The University actively recruits students from protected categories and provides opportunities for the growth and development of these students.

The University's Affirmative Action Program was established in 1973 and includes the monitoring and reporting of compliance with applicable laws and regulations including Titles VI and VII of the Civil Rights Act of 1964, as amended; Executive Order 11246, as amended by Executive Order 11375; Revised Order No. 4; the Equal Pay Act of 1963, as amended; the Rehabilitation Act of 1973 as amended; the Vietnam Era Veteran's Rehabilitation Act of 1974; Titles VII and VIII of the Public Health Service Action; Title IX of the Education Amendments of 1972; The Americans with Disabilities Act; and all applicable laws and ordinances of the State of North Carolina. The University has a published Affirmative Action Plan, copies of which have been distributed to all departments and offices. Copies have also been placed on reserve in the Library.

The Director of Human Resources serves as the Affirmative Action Officer and is responsible for ensuring The University's commitments are met. Contact the Director of Human Resources, 225 King Building, (704) 547-4269.

Discriminatory Personal Conduct

The University seeks to promote a fair, humane, and respectful environment for its faculty, staff, and students. To that end, University policy explicitly prohibits sexual harassment, racial harassment, and all other personal conduct which inappropriately asserts that sex, race, ethnicity, sexual orientation, disability, or ancestry are relevant to consideration of individual worth or individual performance. The same policies provide procedures for the informal or formal resolution of instances where such behavior is suspected or alleged. The policies have received wide distribution and are available for inspection in all administrative offices on campus.

ACADEMIC STRUCTURE

UNC Charlotte is organized into four administrative divisions: Academic Affairs, Business Affairs, Development and University Relations, and Student Affairs. The Division of Academic Affairs includes Academic Programs; Graduate Programs; Library and Information Services; Extended Academic Programs; International Programs; Research; and seven colleges, the

Colleges of Architecture, Arts and Sciences, Business Administration, Engineering, Education, Information Technology and Nursing and Health Professions. The colleges offer more than 65 graduate degrees at the doctoral, master's and graduate certificate levels. Many of the departments throughout The University are involved in teacher education. The College of Education, advised by the University Teacher Education Committee, is responsible for these programs.

Accreditation

UNC Charlotte is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097, telephone number 404-679-4501) to award baccalaureate, master's, intermediate, and doctoral degrees.

The Department of Chemistry is on the approval list of the American Chemical Society. The Master of Public Administration program is accredited by the National Association of Schools of Public Affairs and Administration (NASPAA). The programs in business and accounting are accredited by the American Assembly of Collegiate Schools of Business (AACSB). The University's professional education programs for PK-12 teachers, counselors, and administrators are approved by the North Carolina Department of Public Instruction (NCDPI) and accredited by the National Council for Accreditation of Teacher Education (NCATE). The School Counseling and Agency (Community) Counseling programs in Counselor Education are accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). The generic Nursing program is approved by the National League for Nursing (NLN), and have preliminary approval by the Commission on Collegiate Nursing Education (CCNE); and The Nursing Anesthesia program is accredited by the Council on Accreditation of Nursing Anesthesia Educational Programs (CANAEP).

The University is a member of the Council of Graduate Schools, the Conference of Southern Graduate Schools, and The North Carolina Association of Colleges and Universities.

THE GRADUATE SCHOOL

Administration

Robert J. Mundt, *Associate Vice Chancellor for Graduate Programs and Dean of the Graduate School*

Thomas L. Reynolds, *Associate Dean of the Graduate School*
Gary M. Morgan, *Assistant Dean for Graduate Student Affairs*
Johnna W. Watson, *Assistant Dean for Enrollment Management and Information Systems*

Charles C. Hight, *Dean*, College of Architecture
Schley R. Lyons, *Dean*, College of Arts and Sciences
Claude C. Lilly III, *Dean*, Belk College of Business Administration
Mary Lynne Calhoun, *Interim Dean*, College of Education
Robert E. Johnson, *Dean*, The William States Lee College Of Engineering
Vacant, College of Information Technology
Sue M. Bishop, *Dean*, College of Nursing and Health Professions

The Graduate Council 1999-2000

Kent Curran (Management), Chair of the Graduate Council
Bob Algozzine, Educational Administration, Research and Technology
Lloyd Blenman, Finance and Business Law
Banita Brown, Chemistry
Gerald Ingalls, Geography and Earth Sciences
Irvin Jones, Engineering Technology
Linda Moore, Adult Health Nursing
Carolyn Thompson, Political Science
Peter Wong, Architecture
Liz Fassett, Graduate and Professional Student Government Representative
Robert J. Mundt, Associate Vice Chancellor for Graduate Programs and Dean of the Graduate School (ex-officio, non-voting)
Cynthia "Tia" Gozzi, Director of Library Services (ex-officio, non-voting)

History and Organization of the Graduate School

The University of North Carolina at Charlotte was established in 1965 by the North Carolina General Assembly which transformed Charlotte College, with beginnings in 1946, into a campus of The University of North Carolina. The Graduate School was established in 1985 with the appointment of the first Dean of the Graduate School, although graduate degree programs had been offered since 1969. Today more than 500 members of the Graduate Faculty and more than 2,600 graduate students participate in a broad array of graduate programs at the master's and doctoral levels and in graduate certificate programs.

The executive and administrative affairs of the Graduate School are carried out by the Associate Vice Chancellor for Graduate Programs and Dean of the Graduate School, who acts in cooperation with the deans of the seven colleges of Architecture, Arts and Sciences, Business Administration, Education, Engineering, Information Technology, and Nursing and Health Professions.

The Graduate Council

The Graduate Council, whose voting members are elected by the faculty, reviews, develops and makes recommendations concerning Graduate School policy. All curricular proposals and all criteria for membership on the Graduate Faculty come before the Graduate Council, which also creates appropriate committees and hears grievances. In addition, the Graduate Council serves in an advisory capacity to the Dean of the Graduate School.

The Graduate Faculty

In accordance with criteria developed by each graduate program or unit and approved by the Graduate Council, the Dean of the Graduate School appoints members of the Graduate Faculty for renewable terms. Members of the Graduate Faculty offer courses and seminars, mentor graduate students, and supervise research at an advanced level of scholarship.

The Graduate Coordinators

Each graduate program, and in some cases certain program areas within a discipline, has a Graduate Coordinator. This individual is a member of the Graduate Faculty and is responsible for coordinating various functions of the departmental graduate program. Coordinators assist students with understanding program requirements (along with the student's specific advisor) and can answer program specific questions such as transfer credit, prerequisites, program specific admission requirements, etc.

GRADUATE PROGRAMS

Doctoral or Master's Degree Programs

UNC Charlotte offers more than 65 doctoral and master's degree programs. To be admitted to a degree program, an applicant must meet all the requirements for admission, be recommended by the department in which he/she proposes to study and receive the approval of the Graduate School. Acceptance into one graduate program does not guarantee acceptance into any other program. Acceptance into each program must be approved by the department or college offering the program and by the Graduate School.

Graduate Certificate Programs

Graduate certificate programs are mechanisms for students who wish to complete a coherent graduate program in a defined area in which they do not wish to pursue a degree. Students are admitted to a specific graduate certificate program and are advised by faculty in the unit offering the graduate certificate. Since the graduate certificate is not a degree, students may apply the credits earned in the certificate program toward a degree that they pursue either concomitant with pursuing a graduate certificate or after the certificate has been awarded.

Post-Baccalaureate Study

Applicants seeking to take courses beyond the baccalaureate degree for license renewal, for transfer to another institution, as prerequisites for admission to a graduate degree program or for personal satisfaction may be admitted as post-baccalaureate students. A post-baccalaureate student who is subsequently admitted to full or conditional standing in a degree program may, with the permission of his/her advisor, apply a *maximum* of six hours acceptably completed in the post-baccalaureate status toward a degree.

International Students should contact the Office of International Admissions before applying for this classification.

Dual Undergraduate/Graduate Registration

Undergraduate students at UNC Charlotte who are required to take fewer than 12 semester hours of undergraduate work to fulfill all requirements for the bachelor's degree may be allowed during their final semester to enroll in certain courses for the purpose of obtaining graduate credit. Authorization for dual undergraduate/graduate registration may be obtained by submitting to the Dean of the Graduate School a Special Request Form approved by the student's undergraduate academic adviser, the instructor(s) of the graduate course(s), and the dean(s) of the college(s) offering the graduate course(s), accompanied by a post-baccalaureate application and payment of the application fee. Graduate-level tuition rates will apply. The total hours to be carried in this status shall not exceed 12 hours, of which no more than nine may be for graduate credit. On the basis of work attempted prior to the final semester, such student must meet the grade point criteria for admission to a graduate degree program at the University. No course for which credit is received and applied to an undergraduate degree may receive graduate credit unless the student is accepted into an Early-Entry program Permission to take graduate courses under dual registration does not constitute admission to any graduate degree program at the University.

Readmission - All Students

Post-baccalaureate, graduate certificate and degree students whose enrollment is interrupted will remain eligible to register for two calendar years without having to reapply for admission to the University if they are in good standing and have not exceeded the four, six or eight-year limit for their academic program of study. After an absence of more than 24 months, the student must apply for readmission; acceptance is subject to department or program approval. Students whose enrollment is terminated for academic reasons should consult the description of the procedure outlined in the "Requirements for Readmission" section of the *Catalog*.

Early-Entry to Graduate Programs

Exceptional undergraduate students at UNC Charlotte may be accepted into some master's programs and begin work toward a graduate degree before completion of the baccalaureate degree. In those programs offering this option, an applicant may be accepted at any time after completion of 75 or more hours, although it is expected that close to 90 hours will have been earned by the time the first graduate course is taken. These students will have provisional acceptance status, pending the award of the baccalaureate degree.

To be accepted in this program, an undergraduate student must have at least a 3.2 overall GPA and have taken the appropriate graduate standardized test and have earned an acceptable score. A given program may have more rigorous admissions criteria. If an early-entry student has not met the normal admission requirements of a 2.75 overall undergraduate GPA and a 3.0 junior-senior GPA at the end of his/her baccalaureate degree, she/he will be dismissed from the graduate program.

Students accepted into an early-entry program will be subject to the same policies that pertain to other matriculated graduate students. Generally, it will be assumed that early-entry students will finish their baccalaureate degrees before they complete 15 hours of graduate work. No courses taken before admission to the graduate program may be applied to a graduate degree.

Some early-entry programs are also accelerated. Under this model, ordinarily up to six hours earned at the graduate level may be substituted for required undergraduate hours. In other words, up to six hours of graduate work may be "double counted" toward both the baccalaureate and graduate degrees. Individual programs may allow additional hours at the graduate level to be substituted. In no case may more than 12 hours be double-counted.

Not all graduate programs have the early entry option. Inquiries should be addressed to the appropriate department or to the Graduate School.

GRADUATE STUDENT LIFE

New Graduate Student Orientation

The Graduate School conducts several University-wide orientation programs for new graduate and post-baccalaureate students during the course of the year. Information about the dates and times of these programs can be found on the Graduate School Website (www.uncc.edu/gradmiss/) and in the current *Schedule of Courses*. Information on the fall semester programs is also mailed, beginning in July, directly to new students admitted for the fall semester. New Teaching Assistants are *required* to attend a specific orientation program prior to the fall semester as part of their assistantship contract.

The orientation programs offer information about various University programs and services for graduate students; provide publications, including the *New Graduate Student Handbook*, to serve as resource guides for students; various content workshops on issues relevant to graduate education and graduate student life; and provide opportunities for students to ask specific questions.

Many of the individual graduate programs conduct discipline-specific orientation programs for their new graduate students. Degree students should contact their major department for information on programs that may be available.

Student Involvement

Students at UNC Charlotte are encouraged to participate in cocurricular activities. UNC Charlotte acknowledges that graduate students have many, many priorities in their lives. However, as with so many other aspects of one's life, active involvement enhances the experience.

Graduate and Professional Student Government

The Graduate and Professional Student Government (GPSG) is the governing and primary organization for graduate students to present their needs to the University. The purpose of the Graduate and Professional Student Government (GPSG), according to the by-laws, is to serve as an appropriate voice on campus for graduate students, to meet the various needs of graduate students, and to establish a liaison between graduate faculty, graduate students, and the University.

In the spring of 1998, the Graduate Student Association successfully petitioned the student body through a referendum on the spring student body elections. The results of this referendum provided a significant change in the student body constitution and provided for the Graduate and Professional Student Government to become a separate governing body and representative organization for graduate students. In outlining the reasons for this separation, the GPSG cited the need for a GPSG office and the graduate student share of student activity fees to support: departmental graduate student associations, graduate student travel to read papers at academic conferences, and possibly a Graduate Student Research Forum.

During the 1998-1999 academic year, GPSG began functioning as its own governing body. With the 1999-2000 academic year, the recognition of current (and new) graduate student organizations and the funding of these groups, including the GPSG, becomes the responsibility of the Graduate and Professional Student Government. Since the inception of the GPSG in its current structure, the availability of student activity fees to graduate students directly have increased dramatically.

Graduate Student Organizations

There are a number of graduate student organizations directly associated with academic programs. They include:

American College of Healthcare Executives
American Society of Precision Engineering
Association of Biology Graduate Students
Gamma Theta Upsilon (Geography)
Graduate History Association
Graduate Psychology Association
Master of Public Administration Students

Information on each group is available from the academic program department. Some groups have information available on the Student Life Website at:

http://www.uncc.edu/cone/clubs/clubquery.asp?category=Graduate

Please see additional information on the various programs, offices and services at UNC Charlotte in the "Programs, Services and Facilities" section in the back of this catalog.

ADMISSION TO THE GRADUATE SCHOOL

Admissions Information

The University considers all applications without regard to race, color, sex, sexual orientation, national origin, disability, age or religion. All relevant factors are considered, with major emphasis being placed on the academic history of the applicant. The intent of the University is to offer admission to those applicants whose credentials indicate a strong likelihood of success in their selected curricula.

The University reserves the right to withhold the admission of an applicant who fails to meet any of the requirements for admission, and meeting the minimum admission requirements does not guarantee admission to a graduate program. In addition, the University reserves

the right to restrict enrollments when necessary because of budgetary or other constraints.

Application Materials

A separate application and processing fee must be submitted for **each** graduate program of study for which a student applies. Requests for application materials and additional information about graduate programs should be directed to one of the following.

Domestic Applicants Should Contact:

Office of Graduate Admissions
UNC Charlotte
9201 University City Boulevard
Charlotte, NC 28223-0001

World Wide Web:
http://www.uncc.edu/gradmiss
E-mail: gradadm@email.uncc.edu
Telephone: (704) 547-3366
Fax: (704) 547-3279

International Applicants Should Contact:

Office of International Admissions
UNC Charlotte
9201 University City Boulevard
Charlotte, NC 28223-0001

World Wide Web:
http://www.uncc.edu/intradmn
E-mail: intnlapp@email.uncc.edu
Telephone: (704) 547-2694
Fax: (704) 510-6340

Application Processing Fee

A non-refundable $35 processing fee (drawn on a U.S. bank) must accompany ***each*** application that is submitted. Acceptable forms of payment are a personal check or a money order made payable to UNC Charlotte. Please make sure that your name is clearly noted on the check or the money order as the intended applicant. Applications received without the required fee will remain on file, unprocessed, in our office for one year.

Application Deadlines

Students are encouraged to apply and to submit all supporting documents well in advance of the published deadlines. Some programs have earlier deadlines and may only admit to a particular term. Please contact the department offering the program to which you are applying for specific deadline information. The University may alter the date for acceptance of applications without further notice in accordance with available resources and the enrollment limitation established by the North Carolina General Assembly.

Term of Entry:	Application Should Be Completed By:
Fall	July 1
Spring	November 1
First or Second Summer Session	May 1

Applications from students on non-immigrant visas are due by May 1 for the Fall Semester and October 1 for the Spring Semester.

Application Status

Applicants will be mailed a notice once the application for admission has been received. Applicants can monitor the status of their applications via the Graduate Admissions web site: http://www.uncc.edu/gradmiss.

TYPES OF ADMISSION

(For Doctoral Degrees, Master's Degrees, and Graduate Certificates)

Full Standing

Applicants who meet the general requirements for admission to graduate study plus any additional requirements specified by the college or department of academic concentration for the degree sought will be admitted to full standing.

Provisional Standing

Applicants to graduate programs who have not yet completed their undergraduate or masters degree will be provisionally admitted, pending the University's receipt of final transcripts indicating the award of the baccalaureate or masters degree.

Deferment Policy

An applicant who is admitted to a graduate program of study who fails to enroll for the term to which he/she has been admitted is presumed to have withdrawn his/her application. The application may be reinstated if the request to do so is received within one year from the originally requested term of entry. This request should be in writing and addressed to the Office of Graduate Admissions at least six weeks prior to the term in which the applicant seeks to register. *Students are eligible to update an application for admission for one year from the original term of application.* Applications and supporting documents for persons who are admitted to a graduate program but do not enroll are maintained on file for one year from the original term of application. Note that some programs are selective and require an applicant's credentials to be re-evaluated before deferring admission to a later term.

Policy on Updating Applications

Applicants who do not submit their materials in time to be considered for admission to the requested term are expected to notify the Office of Graduate Admissions to request consideration for admission to a subsequent term. Students are eligible to update an application for admission to a subsequent term for one year from the original term of application. Incomplete applications (including test score reports) are maintained on file for one year from the original term of application. Supporting credentials received without an application will be maintained on file in the Office of Graduate Admissions for one year. All applications for persons who are not admitted are maintained on file for one year.

GENERAL APPLICATION REQUIREMENTS FOR ADMISSION

Doctoral Degree Programs

In order to be considered for admission to a doctoral program, an applicant must have a bachelor's degree from a regionally accredited college or university. Some programs admit baccalaureate students directly to the doctoral program, while others require applicants to have earned a master's degree.

To be admitted after a master's program, an applicant should have earned an overall grade point average of at least 3.5 (on a 4.0 scale) in the graduate degree program. To be admitted after a bachelor's program, an applicant should have earned an overall GPA of at least 3.0, including a 3.0 for the last four semesters of his/her bachelor's degree.

The application package must include:

1) An application submitted to the Office of Graduate Admissions, accompanied by a $35 application fee, which is neither deductible nor refundable. Materials submitted in support of this application cannot be returned.
2) Two official transcripts of all academic work attempted beyond high school. Transfer credit posted on the records of other institutions is unacceptable and official transcripts of these credits must be supplied.
3) Official agency reports of satisfactory test scores as specified in the section on graduate programs in this *Catalog*. GRE/GMAT scores are reportable from ETS for a period of five years from the date of the exam. Therefore, GRE/GMAT scores more than five years old are not accepted since they cannot be officially reported. Likewise, MAT scores more than five years old are not accepted.
4) At least three evaluations from persons familiar with the applicant's personal and professional qualifications.
5) An essay (Statement of Purpose) describing the applicant's experience and objective in undertaking graduate study (Note: Some academic programs have specific items for the applicant to address in the Statement of Purpose; please contact the Office of Graduate Admissions or the academic department for specific requirements).

International Students should see the *Additional Admission Requirements for International Applicants* section of the *Catalog* for additional requirements.

Note:
Applicants with records of high quality who do not fulfill these requirements should discuss with the graduate program coordinator other factors that may have a bearing on admission. Some programs have higher standards or additional admission requirements. Additionally, there may be prerequisites for certain doctoral programs. Students should consult the graduate coordinator for the doctoral program to identify prerequisites. A separate application for admission is required for each graduate, post-baccalaureate, and certificate program of study at UNC Charlotte.

Master's Degree Programs

The applicant must possess a bachelor's degree, or its equivalent, from a regionally accredited college or university, and must have attained an overall grade point average of at least 2.75 (based on a 4.0 scale) on all of the applicant's previous work beyond high school. The average for the junior and senior years must be a 3.0 or better. If the applicant has earned a post-baccalaureate degree, grades in that program will be taken into consideration.

The application package must include:

1) Application submitted to the Office of Graduate Admissions, accompanied by a $35 application fee, which is neither deductible nor refundable. Materials submitted in support of this application cannot be returned.
2) Two official transcripts of all previous academic work attempted beyond high school. Transfer credit posted on the records of other institutions is unacceptable and official transcripts of these credits must be supplied.
3) Official agency reports of satisfactory test scores as specified in the section on graduate programs in this *Catalog*. GRE/GMAT scores are reportable from ETS for a period of five years from the date of the exam. Therefore, GRE/GMAT scores more than five years old are not accepted since they cannot be officially reported. Likewise, MAT scores more than five years old are not accepted.

4) At least three evaluations from persons familiar with the applicant's personal and professional qualifications.
5) An essay (Statement of Purpose) describing the applicant's experience and objective in undertaking graduate study. (Note: Some academic programs have specific items for the applicant to address in the Statement of Purpose; please contact the Office of Graduate Admissions or the academic department for specific requirements).

International Students should see the *Additional Admission Requirements for International Applicants* section of the *Catalog* for additional requirements.

Note:
Acceptance into each program must be approved by the department or college offering the program and by the Graduate School. Meeting minimum requirements for admission does not guarantee acceptance into a program. There may be prerequisites for certain master's programs. Students should consult the coordinator for the master's program to identify prerequisites. A separate application for admission is required for each graduate, post-baccalaureate, and certificate program of study at UNC Charlotte.

Graduate Certificate Programs

The applicant must possess a bachelor's degree, or its equivalent, from a regionally accredited college or university.
The application package must include:
1) An application submitted to the Office of Graduate Admissions, accompanied by a $35 application fee, which is neither deductible nor refundable.
2) An overall grade point average of at least 2.75 (based on a 4.0 scale) on all of the applicant's previous work beyond high school. The average for the junior and senior years must be a 3.0 or better. If the applicant has earned a post-baccalaureate degree, grades in that program will be taken into consideration.
3) Two official transcripts from each institution where academic work was attempted beyond high school.

Some programs may also require:
Standardized test scores, a personal statement (Statement of Purpose) outlining why the applicant seeks admission to the program, and additional admission requirements as specified in program descriptions.

Note:
There may be prerequisites for a graduate certificate program. Students should consult the coordinator for the graduate certificate program to identify prerequisites. Admission to a graduate certificate program does not ensure admission into a graduate degree program. A separate application for admission is required for each graduate, post-baccalaureate, and certificate program of study at UNC Charlotte.

Post-Baccalaureate Study

The applicant must possess a bachelor's degree, or its equivalent, from a regionally accredited college or university. The application consists of a completed application form submitted to the Office of Graduate Admissions, accompanied by a $35 applicationfee which is neither deductible nor refundable.

Note:
A separate application for admission is required for each graduate, post-baccalaureate, and certificate program of study at UNC Charlotte. ***A post-baccalaureate student who subsequently applies and is admitted to full or conditional standing in a degree program may, with the permission of his/her advisor and the Graduate School, apply a maximum of six credit hours acceptably completed in the post-baccalaureate status toward a degree.*** Foreign nationals must contact the Office of International Admissions before applying for this classification.

Additional Admission Requirements for International Applicants

1) Submission of official scores on the Test of English as a Foreign Language (TOEFL) or the Michigan Test (MELAB), if the applicant is from a non-English-speaking country. Required is either a minimum score of 550 on the TOEFL, a minimum score of 220 on the new computer based TOEFL, or a minimum score of 85 percent on the MELAB.
2) A Statement of Financial Responsibility showing the applicant's financial resources during his/her stay in the United States.

Note:
All applicants submitting transcripts from non-U.S. educational institutions should note that some bachelor's degrees given by non-U.S. schools are not equivalent to the U.S. bachelor's degree. Recipients of these degrees are not eligible for graduate study at UNC Charlotte.

An I-20 Form will not be issued until the applicant has been admitted to a degree program and financial responsibility has been proven.

Test Information

Applicants should have their test scores sent directly from the testing agency to the Office of Graduate Admissions (*not* to the department in which they wish to study). **UNC Charlotte's institution code is 5105.**

Graduate Record Examination (GRE)
Sylvan Learning Systems, Inc., administers the computer-adaptive GRE at Sylvan Technology Centers several times per week throughout the U.S. Please call your local Sylvan Technology Center to schedule a test. GRE Subject tests are also offered at Davidson College (704-892-2000). To obtain additional information about the

GRE, visit the GRE Website at http://www.gre.org or call 1-800-GRE-CALL.

Miller Analogies Test (MAT)
The Psychological Testing Corporation administers the MAT. To schedule a test, please call 1-800-228-0752. The Counseling Center at UNC Charlotte at (704)547-2105 also administers the MAT.

Graduate Management Admission Test (GMAT)
Sylvan Learning Systems, Inc., administers the computer-adaptive GMAT at Sylvan Technology Centers several times per week throughout the U.S. Please call your local Sylvan Technology Center to schedule a test. To obtain additional information about the GMAT, visit the GMAT Website at http://www.gmat.org or call 1-800-GMAT-NOW.

Test of English as a Foreign Language (TOEFL)
The TOEFL is offered at the Sylvan Technology Center. Please call your local Sylvan Technology Center to schedule a test (in Charlotte, call 704-364-7758). To obtain additional information about the TOEFL, visit the TOEFL Website at http://www.toefl.org.

FINANCIAL INFORMATION

Student Expenses and Fee Payment

Charges for tuition and fees vary according to the student's status as a resident or nonresident of North Carolina. A nonresident student pays a higher rate of tuition than a legal resident.

The University reserves the right, with the approval of proper authorities, to make changes in tuition and fees at any time.

Student Expenses

Graduate students taking nine or more semester hours and undergraduate students taking 12 or more semester hours during a regular semester will be charged full tuition and fees. Students taking fewer than the nine hours for graduates and 12 hours for undergraduates will be charged a prorated portion of tuition and fees as specified in the fee schedule in this *Catalog*.

Fee Payment

Tuition and fees are due and payable by the date specified on the bill. Advance registration billing and due dates of fees vary with the term. Checks and money orders should be made payable to UNC Charlotte. Visa and MasterCard are accepted.

Residence Status for Tuition Purposes

The basis for determining the appropriate tuition charge rests upon whether a student is a resident or a nonresident for tuition purposes. Each student must make a statement as to the length of his or her residence in North Carolina, with assessment by the institution of that statement to be conditioned by the following:

A) Residence

To qualify as a resident for tuition purposes, a person must become a legal resident and remain a legal resident for at least 12 months immediately prior to classification. Thus, there is a distinction between legal residence and residence for tuition purposes. Furthermore, 12 months' legal residence means more than simple abode in North Carolina. In particular it means maintaining a domicile (permanent home of indefinite duration) as opposed to "maintaining a mere temporary residence or abode incident to enrollment in an institution of higher education." The burden of establishing facts which justify classification of a student as a resident entitled to in-state tuition rates is on the applicant for such classification, who must show his or her entitlement by the preponderance (the greater part) of the residentiary information.

B) Initiative

Being classified a resident for tuition purposes is contingent on the student's seeking such status and providing all information that the institution may require in making the determination.

C) Parents' Domicile

If an individual, irrespective of age, has living parent(s) or court-appointed guardian of the person, the domicile of such parent(s) or guardian is, prima facie, the domicile of the individual; but this prima facie evidence of the individual's domicile may or may not be sustained by other information. Further, nondomiciliary status of parents is not deemed prima facie evidence of the applicant child's status if the applicant has lived (though not necessarily legally resided) in North Carolina for the five years preceding enrollment or re-registration.

D) Effect of Marriage

Marriage alone does not prevent a person from becoming or continuing to be a resident for tuition purposes, nor does marriage in any circumstance insure that a person will become or continue to be a resident for tuition purposes. Marriage and the legal residence of one's spouse are, however, relevant information in determining residentiary intent. Furthermore, if both a husband and his wife are legal residents of North Carolina and if one of them has been a legal resident longer than the other, then the longer duration may be claimed by either spouse in meeting the 12-month requirement for in-state tuition status.

E) Military Personnel

A North Carolinian who serves outside the State in the armed forces does not lose North Carolina domicile simply by reason of such service. And students from the military may prove retention or establishment of residence by reference, as in other cases, to residentiary acts accompanied by residentiary intent.

In addition, a separate North Carolina statute affords tuition rate benefits to certain military personnel and their dependents even though not qualifying for the in-state tuition rate by reason of 12 months legal residence in North Carolina. Members of the armed services, while stationed in and concurrently living in North Carolina, may be charged a tuition rate lower than the out-of-state tuition rate to the extent that the total of entitlements for applicable tuition costs available from the federal government, plus certain amounts based under a statutory formula upon the in-state tuition rate, is a sum less than the out-of-state tuition rate for the pertinent enrollment. A dependent relative of a service member stationed in North Carolina is eligible to be charged the in-state tuition rate while the dependent relative is living in North Carolina with the service member and if the dependent relative has met any requirement of the Selective Service System applicable to the dependent relative. These tuition benefits may be enjoyed only if the applicable requirements for admission have been met; these benefits

alone do not provide the basis for receiving those derivative benefits under the provisions of the residence classification statute reviewed elsewhere in this summary.

F) Grace Period
If a person 1) has been a bona fide legal resident, 2) has consequently been classified a resident for tuition purposes, and 3) has subsequently lost North Carolina legal residence while enrolled at a public institution of higher education, that person may continue to enjoy the in-state tuition rate for a grace period of 12 months measured from the date on which North Carolina legal residence was lost. If the 12 months ends during an academic term for which the person is enrolled at a State institution of higher education, the grace period extends, in addition, to the end of that term. The fact of marriage to one who continues domiciled outside North Carolina does not by itself cause loss of legal residence, marking the beginning of the grace period.

G) Lost but Regained Domicile
If a student ceases enrollment at or graduates from an institution of higher education while classified a resident for tuition purposes and then both abandons and reacquires North Carolina domicile within a 12-month period, that person, if he or she continues to maintain the reacquired domicile into re-enrollment at an institution of higher education, may re-enroll at the in-state tuition rate without having to meet the usual 12-month durational requirement. However, any one person may receive the benefit of the provision only once.

H) Change of Status
A student admitted to initial enrollment in an institution (or permitted to re-enroll following an absence from the institutional program which involved a formal withdrawal from enrollment) must be classified by the admitting institution either as a resident or as a nonresident for tuition purposes prior to actual enrollment. A residence status classification once assigned (and finalized pursuant to any appeal properly taken) may be changed thereafter (with corresponding change in billing rates) only at intervals corresponding with the established primary divisions of the academic year.

I) Transfer Students
When a student transfers from one North Carolina public institution of higher education to another, he or she is treated as a new student by the institution to which he or she is transferring and must be assigned an initial residence status classification for tuition purposes.

In-State Tuition Rate Benefit for North Carolina Teachers

Certain North Carolina teachers may be eligible for the in-state tuition rate for courses taken for teacher certification of professional development as a teacher. To be eligible, the applicant must meet the following criteria: 1) must be paid on the North Carolina teacher salary schedule incident to full-time employment by a North Carolina public school, 2) must be a North Carolina legal resident of any duration, 3) must have established North Carolina legal residence prior to commencement of the course(s) for which the benefit is sought.

TUITION and FEES PER SEMESTER

Following are graduate tuition and fees authorized for 1999-2000. They are subject to change by the appropriate authorities.

Graduate Rates	Resident	Non-Resident
0 Hrs. (Thesis Only)	$48.00	$404.50
0 Hours	$249.00	$1,158.00
1-2 Hours	$249.00	$1,158.00
3-5 Hours	$372.00	$2,189.00
6-8 Hours	$619.50	$3,346.50
9 Hours	$970.00	$4,605.00

Post-baccalaureate students who are taking **only** undergraduate courses will pay tuition and fees at the undergraduate rate. Post-baccalaureate students taking one or more graduate credit courses will pay tuition and fees at the graduate rate for **all** courses.

The following Student Activities Fees are included in the **full-time** tuition and fee amounts. Fees per semester are:

Educational and Technology	$42.00
Student Activity Facility	65.00
Student Activity Center Operations	54.00
Cone Center Facilities	10.00
Cone Center Operating	60.50
Student Activity	20.00
Physical Education Facilities Maintenance	5.50
Physical Education Facility	5.00
Health Center	56.00
Athletic	143.50
Intramural	15.50
Student I.D.	2.00
Total fees per full-time student, per semester	$479.00

Housing Per Semester

Shared Residence Hall space is **not** available to married students and/or their family members. There are apartments for non-married graduate students on campus. The following 1999-2000 prices and plans are subject to change.

Apartments: $1,195.00 to $1,490.00 (Note: graduate student apartments are located in Hunt Village which costs $1,195.00 per semester based on 1999-2000 rates)
Residence Hall, Double Room: $998.00

Residence Hall , Single Room (if available): $1,436.00
Suites: $1,195.00 to $1,460.00

Dining Services

A number of meal service package plans are available for on campus residents (ranging in price from $500 to 1,085 per semester, based on 1999-2000 rates). Commuters or UNC Charlotte apartment residents may purchase any of the package plans or a Declining Balance Account in the amount of $500. There are also several other dining areas throughout campus for cash dining.

Special Assessments

During 1999-2000, the following special assessments were charged to cover the cost of supplies or special materials (per semester, except where indicated otherwise):

Scuba Diving (HPED 2219) $60.00
Advanced Scuba Diving (HPED 2220) $35.00
Applied Music Fee (1 credit hour) $45.00
Applied Music Fee (2 credit hours) $90.00
College of Engineering student fee
1-7 hours (per academic year) $76.00
8 hours or more (per academic year) $150.00
Teacher Licensure Fee $30.00
Cooperative Education Fee $75.00
Architecture Major General Student Fee (per academic year) $80.00
International Student Fee (per academic year) $100.00
Administrative Cancellation Fee $75.00

Application Fee

A $35 application fee must be submitted with the application for admission. The application fee is required for each application submitted. The fee is not deductible and is not refundable.

Housing Deposit

Admission to UNC Charlotte does not guarantee residence hall space. Arrangements for on-campus housing are made, after admission, with the Associate Vice Chancellor for Housing and Residence Life. Residence hall space is not available to married students or their families.

All housing applications must be submitted with a $100 deposit. The deposit is refundable, minus any outstanding damages and charges, upon departure from the residence life system. No deposits for fall semester are refunded after May 14. No deposits for spring semester are refunded after November 24. All students living in the residence halls will have an $11 Residence Hall Association fee included in their semester housing charges.

Student Activities Fees

A part of the general fee provides students with a program of cultural, recreational and entertainment activities. It pays for admission to many athletic contests, dramatic productions, activities sponsored by the University Program Board, social and entertainment functions, and for subscriptions to the campus newspaper and literary magazine. Student Activity fees also provide financial support to the Graduate and Professional Student Government and many recognized graduate student organizations.

Graduation Fee

Each member of the graduating class must pay a graduation fee of $35 at the time he/she applies for the degree. This fee includes the cost of the diploma and the cap and gown. No reduction of the fee is allowed for those receiving degrees in *absentia*. The cost of renting a hood is in addition to the $35 charge.

Credit By Examination Fee

Fees for credit by examination are as follows: A written examination for a course will require a fee of $15. A laboratory examination requiring the arrangement of such things as laboratory materials will require a fee of $25. A combination of a laboratory and written examination will require a fee of $30.

Motor Vehicle Registration Fees

Students attending UNC Charlotte are required to register their motor vehicles(s) in order to park on campus; there is no free parking. Vehicle registration for fall and spring semesters begins two weeks prior to the first day of classes. Students may request parking permits to be mailed directly to them by contacting Parking Services at least one month prior to the beginning of classes (704) 547-4285). Payment must be made before permit is mailed. Enforcement begins the first Monday after classes begin in the fall and spring semester, and the first day of class in the summer terms. Two categories of permits are issued: Resident (for students living on campus) and Commuter (for students living off campus).

Permits sold in August are good for one year. Students who graduate in December may return their parking permit for a partial refund. The price of the permit is the same for faculty, staff and students. For the academic year 1999-2000, permits cost $165. Parking Services receives no state funding, therefore, parking fees are used to defray construction and operating expenses.

Night permits, valid only after 3 p.m., are sold at a reduced rate using the same schedule as the regular student permits. Students with night permits who come on campus before that time must park and pay at the meters or in the visitors deck.

Penalties for Parking Violations

Violators of University parking regulations are subject to monetary penalties ranging from $5 to $100, depending on the seriousness of the violation. Copies of parking regulations are distributed with the parking permit. If

citations are not paid or appealed within ten days, the penalty will be applied to the student's account with the University. Subsequent registration may be withheld for non-payment. Parking citations are issued 24 hours a day. Decals and meters are enforced from 8:00 a.m. until midnight, Monday through Thursday and from 8:00 a.m. until 3:00 p.m. on Friday.

Questions concerning parking on campus should be directed to Parking Services, which is open from 8:00 a.m. until 5:00 p.m. Monday through Friday. Emergency situations and questions at other times should be directed to (704) 547-2200.

Returned Check Policy

If a check is returned by the bank, a certified letter is sent to the maker, indicating that a penalty of $20 has been assessed and the account must be settled within 10 working days or the check will be considered to be a bad check and be processed accordingly. A hold will be placed on the student's record until the bad check is covered and the penalty is paid.

Refunds

Tuition and Fees Refunds

A student who officially withdraws from the University in the fall or spring semester will receive a refund as follows:

Fall or Spring Semester	% of Tuition and Fees Refunded
Before 1st Class Day	100%
Period #1	100% minus $25 withdrawal fee
Period #2	100% minus $75 withdrawal fee
Period #3	80%
Period #4	75%
Period #5	70%
Period #6	60%
Period #7	55%
Period #8	50%
Period #9	40%
After Period #9	0%

Summer School: A student who officially withdraws from the University during summer school will receive a refund as follows:

5 and 10 Week Summer Terms	% of Tuition and Fees Refunded
Before 1st Class Day	100%
Day 1 - 2	100% minus $25 registration fee
Day 3 - 5	80%
Day 6 - 7	70%
Day 8 - 10	60%
Day 11 - 12	50%
Day 13 - 15	40%
After Day 15	0%

Students registered for short courses and institutes only during summer school will receive refunds upon withdrawal from the University as follows:

Special Term	% of Tuition and Fees Refunded
Before 1st Class Day	100%
First Class Day	100% minus $25 withdrawal fee
Second Class Day	50%
After Second Class Day	0%

Exception

Charges are refundable by administrative action on a prorated basis for the unexpired portion of the term for the following reasons: death of the student, withdrawal for adequate medical reason as certified by the University student health center or family doctor, death in the immediate family which necessitates student withdrawal, and dismissal or suspension from school. Appropriate documentation must be submitted to the Registrar.

Housing Refunds

The rental period for academic-year contracts is for the entire academic year (fall and spring semesters) continuing until the end of the spring semester, regardless of occupancy date after the fall semester begins. The housing and dining contract binds the

student and/or guarantor to the full amount of charges for housing for the academic year. Contact the Department of Housing and Residence Life for specific cancellation charges for canceling a signed housing contract (prior to and after assuming residence.

Appeal Procedure
Appeals about tuition, and dining refunds should be submitted in writing to Student Accounts, UNC Charlotte, Charlotte, NC 28223. Appeals about housing refunds should be submitted to Department of Housing and Residence Life, UNC Charlotte, Charlotte, NC 28223. Appeals are heard on a monthly schedule by the Tuition, Housing and Dining Appeals Committee.

FINANCIAL AID

UNC Charlotte administers financial aid without regard to race, color, national origin, religion, sex, sexual orientation, age or disability.

Financial support for graduate students is offered in the form of University fellowships, departmental assistantships, fellowships, and other awards through federal, state, and private grants; veterans' benefits; student loans and hourly paid campus employment.

Eligibility for Need-Based Aid
The programs of need-based student financial aid are administered according to a nationally accepted policy that the family, meaning parents (or those acting in place of parents) and/or spouse, is responsible for a student's educational expenses. Therefore, eligibility for financial aid will be determined by a comparison of a budget (educational expenses as defined above) for the period of attendance with what the student's family can reasonably be expected to contribute.

A financial aid applicant will be considered for available assistance for which he/she is eligible if the student:
1) Completes the application process and related forms only after thoroughly reading all instructions.
2) Completes the admission application process and is accepted for enrollment at UNC Charlotte.
3) Is working toward a degree and not simply taking courses.

Application Process
To apply for the following programs, a student must complete the **Free Application for Federal Student Aid** (FAFSA) using the instructions and mailing address provided with the form. The form is available in the UNC Charlotte Financial Aid Office.

Federal Direct Student Loans
Federal Perkins Loan
Federal Work Study
University Grants
University Loans
University Need-based Scholarships

Renewal Process
Renewal of financial aid is based upon a student's making satisfactory academic progress. The Free Application for Federal Student Aid is required each year that a student applies for financial aid.

Loans
Low interest loans are available through the Federal Perkins Loan and the William D. Ford Federal Direct Loan. To apply for these loans, students should complete the Free Application for Federal Student Aid (available from the Office of Student Financial Aid and on their electronic Website, http://www.uncc.edu/finaid/fafsa.htm) before the established priority date of April 1 preceding the school year.

Federal Perkins Loan - Applicants may request amounts based on financial need up to a total of $15,000 for a four-year degree and an aggregate total of $30,000 for graduate study. The interest rate is five percent with repayment beginning nine months after graduation.

William D. Ford Federal Direct Loans - Graduate students may borrow up to $8,500 per year. Independent students may be eligible to receive additional loan amounts. The interest rate is variable, and repayment begins six months after the borrower ceases to be a student.

Short-Term Emergency Loans - Students may borrow up to $150 for unanticipated expenses that occur during the semester and up to $1,000 for tuition expenses. The loans have a $1 service charge, but no interest is charged. Loans must be repaid within 30 to 60 days. Funds for these loans are provided by private donation.

Grants
Scholarships are available to North Carolina residents to assist with tuition and fees and are funded through the State Appropriated Grant program and the Minority Presence Grant program. Grants to fund the difference between out-of-state and in-state tuition are available for students of high merit who have also received a graduate assistantship. Students should contact their graduate coordinator about application procedures.

North Carolina Minority Presence General Grant Program
The University funds the Minority Presence Grant Program under the University of North Carolina Board of Governors general Minority Presence Grant Program, Part I provides for grants to white students at predominately black institutions and to black students at predominately white institutions who are residents of North Carolina, are enrolled for at least three hours of degree credit course work, and demonstrate financial

need; Part II provides funds for grants to Native Americans and other minority students at the constituent institutions of the University of North Carolina who are residents of North Carolina, are enrolled for at least three hours of degree credit course work, and have demonstrated financial need. Eligible students must be nominated for these awards by their department or program.

Non-Resident Tuition Differential Grant
This grant is available in selected graduate programs to non-residents of North Carolina. To be eligible, a student must be admitted to full standing in a graduate program, and must hold an assistantship.

North Carolina Graduate Grant
There are a limited number of tuition scholarships available for North Carolina residents to assist with tuition and fees. These are for students of high merit who have also received a graduate assistantship. Students should contact their graduate coordinator about application procedures.

UNC Charlotte Grants
UNC Charlotte administers several other grant programs funded by the State of North Carolina and requires North Carolina residency for consideration. These are available to graduate students who apply by the established priority date of April 1.

UNC Charlotte Need Based Grant
Need-based financial aid is also available to graduate students. To determine eligibility the Free Application for Federal Student Aid (FAFSA), must be completed and returned to the Financial Aid Office as soon as possible.

Graduate Assistantships

Approximately one-half of the University's full-time graduate students hold graduate assistantships which provide them with financial aid and valuable experience in administration, teaching, and research related to their academic endeavors.

To be eligible for an assistantship, a student must be admitted to full standing in a graduate program and must have an undergraduate GPA of at least 2.75 with a 3.0 or better for the junior and senior years or must have completed at least six hours of graduate work with a GPA of 3.0 or better.

To retain their appointments, graduate assistants must maintain appropriate enrollment, register for at least 6 graduate-level hours each semester, make satisfactory progress toward their degrees, maintain a 3.0 GPA and perform their assigned duties satisfactorily. It is expected that graduate assistants will not engage in other employment during the term of their assistantship.

Assistantships are available in most graduate degree programs and through some administrative offices. To apply, students should complete the Application for Graduate Assistantship (available from the Graduate School) and submit it to the degree program or administrative office in the winter preceding the academic year for which the assistantship is sought.

Fellowships/Scholarships

John Paul Lucas, Jr. Scholarship
This is an award given each spring semester to a student who has been teaching and wishes to pursue a graduate degree in English in the College or Arts and Sciences or College of Education.

Giles and Stones Fellowships
Stipends are available to selected doctoral students from donations made to the University by the Giles and Stone families. These awards are usually given in addition to a graduate assistantship.

The Zonta Club
The Zonta Club award is given annually to an undergraduate or graduate students who is continuing a university education after considerable time away from formal education. This award covers the cost of one-year's in-state tuition.

Architecture
Every graduate students in the Master of Architecture program is eligible to be considered for this $2,500 scholarship. No application is required. Contact the College of architecture for more information.

Chemistry
Clariant Chancellor's Scholarship. Contact the Department of Chemistry.

Criminal Justice
Dean Reep Scholarship awarded for $500. Contact the Department of Criminal Justice.

Nursing
Federal Professional Nurse Traineeship Grant and North Carolina Masters Nurse Scholars Program. Contact the College of Nursing and Health Professions.

National Fellowships
These awards are made to an individual rather than to the University. Recipients are chosen through competitions expressive of the terms of each award. Some examples of these awards are listed below. Contact the graduate program coordinator to discuss available fellowship programs in a specific field.

- National Science Foundation (NSF) Graduate Research Fellowship
- Ford Foundation Predoctoral Fellowship for Minorities
- Department of Defense National Defense Science and Engineering Graduate Fellowship (DOD NDSEG)
- Department of Energy Computational Science

Graduate Fellowship
NASA Graduate Student Researchers Program – Underrepresented Minority Focus Award
National Consortium for Graduate Degrees for Minorities in Engineering Inc. (GEM) Fellowship
National Physical Science Consortium: Graduate Fellowships for Minorities and Women in the Physical Sciences

Employment Opportunities

The Office of Student Employment assists students in locating work on campus. The University participates in the Federal Work-Study Program and attempts to match students with jobs related to their academic interests. To apply for the Federal Work-Study Program, students should complete the Free Application for Federal Student Aid (available from the Office of Student Financial Aid; see the Website address above under "Loans") before the established priority date of April 1 preceding the school year. The University Career Center assists students in locating part-time and summer employment work off campus.

The University Career Center assists students in obtaining part-time employment off-campus. Job listings and assistance are available in the King Building. Students are encouraged also to participate in career related experiences such as co-op, internships, and 49erships that can be arranged through the University Career Center.

Education for the Vocationally Handicapped

Students who have suffered a disability which renders them vocationally handicapped are eligible for aid provided by the North Carolina State Division of Vocational Rehabilitation. This aid takes the form of services that include vocational counseling and guidance and placement. Payment of expenses such as training, medical treatment, room and board, books, fees and tuition may be available. A vocational rehabilitation officer is available in Charlotte for interviewing applicants. Appointments may be made by contacting Vocational Rehabilitation Services located at 401 S. Independence Blvd., (704) 342-5049.

Veterans Benefits

UNC Charlotte's Veterans Office (VSO), located in the Office of the Registrar, works with the Veterans Administration to assist in administering the various programs of benefit to veterans or eligible relatives of veterans. The VSO Certifying Official certifies enrollment and transmits necessary credentials and information to the proper Veterans Administrative Office.

Admission to the University should be obtained before the student makes application for veteran's benefits. Applicants must be accepted into a degree program to receive benefits.

In order to be eligible for the full monthly allowance under any of the above laws, an undergraduate student must be enrolled for 12 or more semester hours and a graduate student must be enrolled for nine or more semester hours. Those enrolled on a part-time basis will be eligible for part-time compensation. Students are responsible for reporting any change in enrollment status to the VSO Certifying Official.

Children of Veterans

The North Carolina Department of Veterans Affairs awards scholarships for the children of certain deceased or disabled veterans. Those awarded "full" scholarships are entitled to tuition, mandatory fees, board allowance and room allowance; those awarded "limited" scholarships are entitled to tuition and mandatory fees. All inquiries should be referred to the North Carolina Division of Veterans Affairs, Albermarle Building, Suite 1065, 325 North Salisbury St., Raleigh, NC 27601,(919) 733-3851.

Before the time of registration, each eligible student who wishes to enter the University should: 1) apply for admission following University procedures, and 2) apply for a scholarship award to the North Carolina Department of Veterans Affairs.

ACADEMIC REGULATIONS and DEGREE REQUIREMENTS

Student Responsibility

Each student is responsible for the proper completion of his or her academic program, for familiarity with the *Graduate Catalog* (and where appropriate, the *Undergraduate Catalog*), for maintaining the grade average required and for meeting all other degree requirements. The adviser will counsel, but the final responsibility remains that of the student.

A student is required to have knowledge of and observe all regulations pertaining to campus life and student deportment. The University has enacted two codes of student responsibility: **The UNC Charlotte Code of Student Academic Integrity and The UNC Charlotte Code of Student Responsibility** which are summarized in this *Catalog*. As students willingly accept the benefit of membership in the UNC Charlotte academic community, they acquire obligations to observe and uphold the principles and standards that define the terms of UNC Charlotte community cooperation and make those benefits possible.

Each student is responsible for maintaining communication with the University and keeping on file with the Registrar's Office at all times a current address, including zip code, and telephone number.

Each student, while associated with the University, is expected to participate in campus community life in a manner that will reflect credit upon the student and the University.

Catalog Policies

The *Catalog* is not an irrevocable contract. Regulations published in it are subject to change by the University at any time without notice. University regulations are policy statements to guide students, faculty and administrative officers in achieving the goals of the institution. Necessary interpretations of these policies will be made by the appropriate authorities with the interest of the students and the institution in mind. Students are encouraged to consult an adviser if they have questions about the application of any policy.

Each new edition of the catalog becomes effective at the opening of the fall semester following its publication.

Exceptions to these policies may be necessitated by changes in course offerings, degree programs or by action of authorities higher than the University. In that event, every effort will be made to avoid penalizing the student.

Course Load

An appropriate course load is dependent upon two factors: the scholastic ability of the student as reflected by his/her academic history and the time available for study. A course load of nine semester hours constitutes a normal full semester program for a graduate student. This is lower than the normal undergraduate load because of the extensive reading, independent thinking and individual research required of graduate students. Generally, graduate students should not register for more than 12 semester hours during a semester.

A graduate assistant must register for at least six graduate-level semester hours during each semester in which an assistantship is awarded.

Registration

The Registrar is responsible for the management of the registration process by which students enroll in classes. Registration policies and procedures for each term are described in the *Schedule of Classes* for that term.

Through the registration process, students assume academic and financial responsibility for the classes in which they enroll. They are relieved of these responsibilities only by formally terminating enrollment by dropping or withdrawing in accordance with procedures and deadlines specified in the *Schedule of Classes* each term.

Registration Deadlines

University policies determine when students may enroll or adjust their enrollment in classes. Deadlines for the spring and fall semesters are shown below. (*Deadlines for summer sessions are approximately proportional based on the length of the session.*)

Register for classes through the eighth instructional day of the semester.

Drop a class without record (and remain enrolled in other classes) through the sixth instructional day of the semester.

Withdraw from the University without record through the sixth instructional day of the semester.

Drop a class with grade of W recorded (and remain enrolled in other classes) through the sixth week of classes in the semester. No student will be allowed to drop a course after this deadline unless there are extenuating circumstances recognized by the University.

Withdraw from the University with grade of W recorded after the sixth instructional day through the third week prior to the last day of classes of the semester. No student will be allowed to withdraw after this deadline unless there are extenuating circumstances recognized by the University. (See "Termination of Enrollment" section of this *Catalog*.)

Prerequisites and Permits

Credit will be awarded only to students who are properly registered for it. All students, including visitors and non-degree students, are required to meet course prerequisites and to obtain the required permissions to enroll in courses specified in the *Schedule of Classes*.

Auditors

With the consent of the instructor, a student may register as an *auditor* for any class in which space is available. Fees and procedures for this non-credit enrollment are the same as those for a credit enrollment.

No student will be allowed to change the designation of a course from audit to credit or from credit to audit after the eighth instructional day of a semester (or a proportional period for summer school).

The participation of auditors in class discussion and in tests or examinations is optional with the instructor. Auditors receive no University credit, but they are expected to attend class regularly. A formal record of the audit on the student's transcript is entered at the discretion of the instructor at the end of the course. The procedure for adding or dropping an audit course is the same as for credit enrollments.

Continuous Registration

Students in graduate degree programs are required to maintain continuous registration (fall and spring semesters) for thesis, dissertation, project, or directed study until work is completed. Students are not required to enroll in any summer term unless they are using campus facilities or they are completing degree requirements in that term. Continuous registration begins the semester approval for his/her thesis, dissertation, project, or directed study topic is received. Approval of this topic is documented on the "Petition for Topic Approval" form which is filed by the student with the Graduate School. Students who exceed the required number of hours without completing their work should register for "7999" or "9999" (graduate residence) until the thesis, dissertation, project, or directed study is completed.

Students who have completed their course work and the number of thesis/dissertation hours for credit required in their graduate degree program must take one of two actions:

1) Students who will continue to use University resources in completing their degrees must enroll in and pay tuition and fees for not less than one hour of graduate residence credit each semester.
2) Students who will not use University resources should apply for a leave of absence. Students choosing this option must file a formal petition for a leave of absence that states they will not use University resources during the leave period. If the leave of absence extends beyond two calendar years, the student must re-apply for active status in the graduate program.

Students must be enrolled during the term (semester or summer) in which they graduate from the university.

Change of Degree Program

To change from one degree program to another, a graduate student must fill out the application for admission to the new program, pay the $35 application fee, and provide supporting documentation as specified in this *Catalog*. Contact the Office of Graduate Admissions for additional information.

Termination of Enrollment

Drop

A student may terminate enrollment in a course but continue enrollment in other courses by following the procedure to drop a course specified in the *Schedule of Classes*. A student enrolled in only one course must withdraw officially from the University to drop the course.

Withdrawal from the University

Any student voluntarily leaving the University before the close of the term must withdraw officially. A student initiates the withdrawal procedure and files the completed form at the Registrar's Office in person or by letter. A withdrawal is effective when the form or letter is received by the Registrar's Office. A student who withdraws from the University after the sixth instructional day will receive the grade of *W* for all courses in progress. No student will be allowed to withdraw within two weeks prior to the last day of class (or as close to half the summer term as possible) unless there are extenuating circumstances such as serious illness recognized by the University and approved by the student's dean.

Any student who leaves the University before the close of a term without withdrawing officially will receive a failing

or unsatisfactory grade (*U* for graduate credit) in each course for which he/she is registered. A graduate student who receives a *U* must appeal to the Dean of the Graduate School for reinstatement.

Attendance Policy

Each instructor determines the attendance regulations for his or her classes. Students are expected to attend punctually all scheduled sessions in the courses for which they are registered and are responsible for completing the work from all class sessions.

Absences from class may be excused by the instructor for such reasons as personal illness, religious holidays, or participating as an authorized University representative in an out-of-town event. Whenever possible, students are expected to seek the permission of the instructor prior to absences.

Grading Policies

Instructors assign grades on the basis of their evaluation of the academic performance of each student enrolled in their courses. At the end of the term, the grades are reported to the Registrar's Office which is responsible for maintaining student academic records and reporting grades to students.

Grade Reports

All students enrolled in the University receive reports of *final grades* from the Registrar after the close of each term. The reports are mailed to the student at the address designated by the student. Final grades also are available through the telephone registration system (consult the ***Schedule of Classes*** for access instructions) and through the Registrar's web page. In addition, the faculty will send special reports of *unsatisfactory grades* to the students near the middle of each regular semester.

Grades

Letters are used to designate the quality of student academic achievement.

GRADUATE GRADES		
Letter	**Meaning**	**Grade Points per Semester Hour**
A	Commendable	4
B	Satisfactory	3
C	Marginal	2
U	Unsatisfactory	0
I	Incomplete	

GRADUATE GRADES		
Letter	**Meaning**	**Grade Points per Semester Hour**
IP	In Progress	
W	Withdrawal	
P	Pass	
NC	No Credit	
AU	Audit	
NR	No recognition given	

Certain graduate courses, such as research seminars, tutorials, internships, theses or dissertations, may be designated for *Pass/No Credit* or *Pass/Unsatisfactory* grading upon recommendation of the offering department and approval of the Graduate Council. The grade of *P* in such a course shall be considered as evidence of satisfactory performance. A grade of *N(No Credit)* will not affect eligibility for continued enrollment nor will it apply toward requirements for the degree.

Grade Point Average

The grade point average for a graduate student is based only on those courses in his/her approved program of study taken at UNC Charlotte. It is determined by multiplying the number of grade points for each grade (*A*=4, *B*=3, *C*=2, *U*=0) by the number of semester hours credit received in that course, adding all accumulated grade points together, and then dividing by the total number of semester hours the student has attempted except those for which the student received a grade of *I, IP, W, P, NC, AU,* or *NR*. When a course not listed as "May be repeated for credit" is repeated, no additional credit hours attempted accrue and the hours earned and grade points of the previous grade are replaced by those of the current grade.

Graduate students must have a 3.0 GPA in the courses on their degree plan of study in order to graduate. However, the grades for all courses attempted will remain on the transcript and will be included in the calculation of the student's GPA as it is reported on the transcript.

Grade of *I* (Incomplete)

The grade of *I* is assigned *at the discretion of the instructor* when a student who is otherwise passing has not, due to circumstances beyond his/her control, completed all the work in the course. The missing work must be completed by the deadline specified by the instructor or during the next semester (fall or spring) in residence, but no later

than 12 months after the term in which the *I* was assigned, whichever comes first. If the *I* is not removed during the specified time, a grade of *F, U* or *N* as appropriate is automatically assigned. *The grade of I cannot be removed by enrolling again in the same course.*

Grade of *IP* (In Progress)

The grade of IP is based on coursework for courses that extend over more than one semester. For example, a course that requires enrollment for two consecutive semesters would be eligible for an IP grade in the first term (i.e., graduate thesis, dissertation). The grade in the second term is also awarded for the course in the first semester. A grade of IP should not be given for coursework to be completed in one given term. It cannot be substituted for a grade of "I." The IP grade expires after six years, and if no final grade has been awarded by that time, the IP grade will default to a grade of NC (no credit).

Grade of *W* (Withdrawal or Drop)

No grade will be given for a course dropped on or before the last day to drop a course without record. After this period a student who is permitted to drop or withdraw from a course will receive a grade of *W*. Only students with such extenuating circumstances as serious illness will be permitted to drop a course after the sixth week of classes in the semester or to withdraw from all courses during the last two weeks of classes in the semester. Unsatisfactory academic performance itself is not an extenuating circumstance. The time of withdrawal is determined by when the drop card or withdrawal form is accepted by the Registrar's Office.

Repeating a Graduate Course

A graduate student will be allowed to repeat a maximum of two courses in which the student has been assigned a grade of *C, U* or *NC* (but not an *I*). If the course grade has resulted in termination of enrollment, the student must appeal to be reinstated in order to repeat the course. A given course may be repeated one time only. Whenever a course is repeated, no additional hours attempted accrue, and the new grade replaces the previous grade in computing the grade point average and in the assignment of academic credit. The record of the first attempt will remain a part of the student's permanent record and will count in the number of marginal (C) grades accumulated. Successfully repeating a course does not change the number of marginal (C) grades accumulated. Enrollment will be terminated if a student receives a grade of *U* in a repeated course.

Final Grade Changes/Appeals

When a grade of other than *Incomplete* (I) is reported officially by an instructor at the end of a term, the grade is recorded by the Registrar and can be changed only if an error has been made in assigning or reporting the grade. When a grade is assigned consistent with University policy, only the instructor has the right to change the grade except as provided in the *Incomplete* grade policy.

When an instructor reports a change for a grade other than *I*, the Change of Grade Form must be signed by his/her department chairperson and dean. When a student believes that a course grade is incorrect, the student's inquiry should be directed to the instructor within 10 days after the formal grade report is received. If the student is unable to resolve the grievance through consultation with the instructor, a written request for review of the course grade may be submitted to the graduate coordinator or program in which the course was taught. Requests for review must be submitted within the first four weeks of the next regular academic semester. Requests for review submitted after the deadline will be heard only in exceptional cases as determined by the Dean of the College in which the appealed course grade occurred. To initiate a grade review, the student should request in writing to the graduate coordinator a review of the final course grade.

Grades are appealed through the program offering the course and then, if necessary, through the college in which the grade was assigned. Course grades may not be appealed to the Graduate Council.

Academic Records and Transcripts

The Graduate School is responsible for maintaining the official academic records for all students. Upon *written request by the student*, an official transcript of the academic record will be issued, by the Registrar's Office to the person or institution designated, provided that all the student's obligations to the University have been settled satisfactorily.

Requirements for Continued Enrollment

Students enrolled in any graduate program must maintain satisfactory progress toward the degree. Students are expected to achieve a commendable or satisfactory grade (*A* or *B*) in all course work attempted for graduate credit.

An accumulation of three marginal (C) grades will result in termination of the student's enrollment in the graduate program. If a student makes a grade of *U* on any course, enrollment will be terminated. A graduate student whose enrollment has been terminated because of grades is ineligible to attend any semester or the summer session unless properly readmitted.

A student reinstated in a graduate program will be expected to complete the degree program with satisfactory or commendable performance. Should the student receive a grade of *C* or *U* after being reinstated in the program, his/her enrollment in the graduate program will be terminated.

Requirements for Readmission

Students in good standing

Students seeking reinstatement for a term that is two years or more after the term he/she last attended also must apply for readmission to the Graduate School.

Students whose enrollment is terminated for academic reasons

Students must appeal their suspension and be reinstated in order to continue their program of study. After notification of termination is received, the student initiates the appeal procedure by submitting a Suspension Appeal Form (sent to the student with the notice of termination) to the graduate coordinator of his/her academic program explaining any extenuating circumstances. The graduate coordinator will forward this form to the Graduate School with a recommendation regarding reinstatement.

The department/college will designate a readmittance committee to consider the student's appeal. The committee will be composed of faculty members other than the faculty member(s) who assigned the grade of *C* or *U* that resulted in the suspension. The readmission committee recommends to the Dean of the Graduate School that the student either be reinstated to or dropped from the program. The readmission committee makes a recommendation in each case on its individual merits. The Dean of the Graduate School will notify the student of the decision in writing.

Transferred Credit

The student's graduate program coordinator is responsible for determining the applicability of transferred credits to graduate program requirements. See the appropriate "Degree Requirements" sections of this *Catalog* for the number of hours that may be transferred and "Time Limit" sections for completion of courses. General rules governing transferred credit are:

1) To obtain approval to receive transfer credit, the student must submit an *Application for Transfer of Credit into a Graduate Degree Program* form (available in the Graduate School office), approved by the graduate program coordinator, to the Dean of the Graduate School. If the courses being transferred are from another institution, the student must include a copy of the transcript along with the request. **The University is not obligated to accept any courses for transfer credit.**
2) The grade in any course accepted for transferred credit must be the equivalent of that awarded for commendable (A) or satisfactory (B) work as defined by UNC Charlotte.
3) Courses accepted for transfer are subject to the same time limitation as courses taken in residence.
4) To be considered for transferred credit, the courses must have been undertaken at a regionally accredited institution.
5) Courses in which credit is accepted must be appropriate for approved University programs and curricula in which the student is enrolled.
6) To obtain approval to take a course at another institution while at UNC Charlotte, a student must complete an *Application for Transfer of Credit into a Graduate Degree Program* form, have it approved by the graduate program coordinator prior to taking the course, and file it in the Graduate School. Upon completion of the course(s) the student must request that an official transcript be mailed to the Graduate School listing the course(s) to be transferred.
7) Transfer credit is not awarded for post-baccalaureate students.

Credit by Examination

A student currently enrolled at UNC Charlotte may pass a specially prepared challenge examination and receive credit for a University course without having to do the normal course work. The student contacts the program in which credit is sought to request administration of an examination. Since it may not be appropriate to award credit by examination for some courses, the decision to offer an examination is that of the program. If the graduate program authorizes an examination, the student is instructed to pay the fee for credit by examination and to bring the receipt of payment to the examination. Credit by examination will be indicated on the transcript, but no grade points will be awarded. Failure on such an examination will incur no grade-point penalty. No student may challenge a course for which either a passing or failing grade has been received at UNC Charlotte.

Application for the Degree

Each student should make application for his/her degree on a form obtained from the Graduate School or the Graduate School's WebPage no later than the filing date specified in the University Calendar. The application must be accompanied by the filing fee in effect at the time of the application. Degrees are awarded at commencement exercises held at the end of the spring and fall semesters; however, the diploma and transcript will reflect the term in which all requirements were completed.

Earning A Second Degree

Second Master's Degree

A student is permitted to earn a second master's degree subject to the following conditions:

1) no work applied to a previously awarded degree may be applied to the new degree program,
2) the student must be admitted to a degree program different from that of his/her previous graduate degree(s),
3) the student must successfully meet all requirements for the new degree.

Appeal Procedure

Any student or applicant may appeal any decision affecting his/her status as a graduate student, except course grades, by submitting a written petition to the Appeals Committee of the Graduate Council in care of the Graduate School after remedies have been exhausted in the appropriate college.

The petition shall briefly describe the facts that support his/her claim and the remedy being sought. The petition

must be submitted within six calendar months of notification of the action being appealed. After receiving the petition, the chairperson of the Appeals Committee will schedule a hearing as soon as possible. A hearing will be held within 60 days of receipt of the written petition of appeal. Evidence will be received from the petitioner and other parties having information bearing on the appeal. The chairperson of the Appeals Committee shall report its decision on any appeals matter a) directly to the Dean of the Graduate School and b) to the Graduate Council at the first meeting following the hearing. The Dean of the Graduate School shall advise the petitioner in writing of the decision of the Appeals Committee within 30 days after the end of the hearing. Questions about the procedure should be addressed to the Dean of the Graduate School.

Other Academic Grievances

Other grievances relating to academic status are to be addressed by the college where the grievance arises, or if no particular college is appropriate, by the Assistant Vice Chancellor for Academic Programs. Written procedures are available from the dean of each college and the Associate Vice Chancellor for Enrollment Management.

The Code of the University of North Carolina provides that under certain conditions a grievant may appeal from a chancellor's disposition of a grievance. The line of appeal is to the president or Board of Trustees. The line of appeal from a decision of the president or the Board of Trustees is to the Board of Governors.

The full text of the Board of Governors regulation concerning time limits on appeals may be found on-line as Item III-J-7 in "The Administrative Manual of the University of North Carolina" at: http://www.ga.unc.edu/publications/admin_maual/.

MASTER'S DEGREE REQUIREMENTS

Residence Requirements

No more than six semester hours of transferred credit are accepted toward a master's degree. All other work must be residence credit.

Residence credit is credit that is earned under the conditions specified herein and may be applied toward the attainment of graduate degrees at UNC Charlotte. These conditions must be satisfied regardless of the location in which the course is given.

1) Instruction: The instructor must be a member of the UNC Charlotte Graduate Faculty.
2) Course(s): The content of each course must be approved by regularly established college, Graduate School and University curricular processes before the course is scheduled or offered.

Residence credit may also be awarded by virtue of an examination administered by the faculty of the department offering credit. A student also, with the prior approval of the appropriate UNC Charlotte department and of the Dean of the Graduate School, may take graduate courses for residence and course credit at other regionally accredited institutions.

Program Approval

Each student's individual program of study must be approved by his/her department/college. Up to six hours of transferred credit may be included in the approved program of study.

Admission to Candidacy

Upon successful completion of a minimum of 18 semester hours of graduate work and in no case later than four weeks prior to the beginning of the semester in which he/she expects to complete all requisites for the degree, a student should file for admission to candidacy on a form supplied by the Graduate School. This application is a check sheet approved by the student's adviser, department chairperson and college dean listing all course work to be offered for the degree (including transferred credit and courses in progress).

Minimum Hours and Quality

A student is expected to satisfactorily complete a minimum of 30 to 60 semester hours of approved courses, depending upon his/her individual program, with an overall GPA of 3.0 or better in courses on the degree plan of study. Grades in all courses attempted, whether or not on the plan of study, will remain on the transcript and will be included in the calculation of the student's GPA as it is reported on the transcript. At least half of the semester hours in the approved program must be in courses numbered 6000 or above. No more than six hours evaluated as *C* may be counted toward the minimum hours required for the master's degree.

Comprehensive Examination

After admission to candidacy, each student must successfully complete a comprehensive examination. The examination may be written, oral, or both, depending upon the student's specific program requirements. Students must be enrolled during the semester in which they take the comprehensive examination.

Time Limit

Candidates must complete all requirements for a master's degree, including accepted transferred credit, within six years of the end of the first semester in which they registered in the Graduate School. Courses that exceed this time limit must be revalidated or retaken, whichever the graduate program decides necessary, if they are to be included in the degree program.

To revalidate a course, the student, along with the program coordinator, must prepare a revalidation plan

that must be reviewed and approved by the Dean of the Graduate School. This plan often involves taking a special examination designed by the faculty of the graduate program. Once the plan has been completed, the program coordinator must notify the Dean of the Graduate School in writing.

Students may not revalidate courses with a grade of Cor lower, courses that are internships or other forms of practica, or courses taken at other institutions.

Thesis

The plan of study for a master's degree may or may not include completion of a thesis. The thesis and non-thesis approaches are designed to meet the needs of students preparing for different types of careers and represent qualitatively different educational experiences. Consequently, the academic departments and the Dean of the Graduate School discourage any switching from one plan to another. If a switch from a thesis to non-thesis plan is approved, the grade of *I* for the thesis work will be changed to *W* on the transcript with no refund of tuition for the course(s). At the time that the graduate program approves the student's thesis topic, the Petition for Topic Approval must be filed with the Graduate School. This form is available in the Graduate School.

The thesis must be submitted for final approval by the student's thesis committee at least three weeks before the date of the oral examination in which the thesis is defended. Following the successful completion of this defense, the master's candidate must submit three unbound copies of the approved and error-free thesis to the Graduate School no later than the filing date indicated in the University Calendar.

Course and Other Requirements

The course and other requirements for specific degree programs are presented in the section of this *Catalog* on Graduate Programs.

Ph.D. DEGREE REQUIREMENTS

A doctoral degree is conferred by the University after the student has demonstrated outstanding scholarship in an approved program of study. Candidates must satisfyall University degree requirements in addition to all standards established by the doctoral faculty of their particular program. Specific program degree requirements are listed under the respective doctoral programs in this *Catalog*. In some cases, requirements in a given program are more stringent than the minimum requirements established by the Graduate School.

Ordinarily, a student must complete at least 72 post-baccalaureate credit hours in order to earn the Ph.D.

Program of Study

Although the maximum amount of credit past the baccalaureate degree that a Ph.D. student may count towards a doctorate is 30 semester hours, **only courses appropriate for the approved program and curriculum in which the student is enrolled may be transferred.** This should be determined by the student's supervisory committee and approved by the program coordinator, before the request is submitted to the Graduate School. This rule applies whether the courses were taken at UNC Charlotte or elsewhere and whether a master's degree was earned or not. However, no more than six hours taken when the student was in post-baccalaureate (non-degree seeking) status may be applied toward the doctoral degree.

Program Approval

By the end of the first semester of the third post-baccalaureate year in the program, and no later than the filing of the petition to sit for the qualifying examination, a student's program of study must be approved by his or her advisory committee and submitted to the Dean of the Graduate School.

Course and Other Program Requirements

The course and other requirements for each degree program are indicated in the program descriptions in the following pages.

Time Limit

Candidates must complete all work beyond the master's degree, including accepted transferred credit, within eight years from the time they first register as doctoral students. Courses that exceed this time limit must be revalidated or retaken, whichever the graduate program decides is necessary, if they are to be included in the degree program.

To revalidate a course, the student, along with the program coordinator, must prepare a revalidation plan that must be reviewed and approved by the Dean of the Graduate School. This plan often involves taking a special examination designed by the faculty of the graduate program. Once the plan has been completed, the program coordinator must notify the Dean of the Graduate School in writing.

Students may not revalidate a course with a grade of C or lower, courses that are internships or other forms of practica, or courses taken at other institutions.

Residence

All doctoral students are required to complete a substantial residency requirement during which they have sustained contact with the graduate faculty. This requirement is specified in the program descriptions.

Graduate Faculty Representative

The graduate faculty representative is a member of the doctoral student's advisory committee appointed by the Graduate School. This faculty member's role is primarily procedural. He/she must 1) assure that the doctoral student is treated fairly and impartially by his or her advisory committee, and 2) assure that University standards and policies are upheld. This representative is appointed prior to the student's taking the qualifying examination and must participate in the examination, in the dissertation topic approval process, and in the final examination. A student's advisor may consult with the Dean of the Graduate School regarding selection of this representative.

Qualifying Examination

Each student must complete a qualifying examination. Students who enter a Ph.D. program directly from a baccalaureate program must sit for this examination before the end of their third post-baccalaureate year in the program; students who enter a Ph.D. program from a master's degree program must sit for it before the end of their first year in the doctoral program. To sit for this examination, the student must have at least a 3.0 GPA and must have removed any conditions upon admission.

Re-examination

A student who fails the qualifying examination may petition the program faculty to be re-examined. The re-examination may take place no sooner than the beginning of the semester following the one in which the failure occurred. A student who fails the qualifying examination a second time may not continue in the doctoral program.

Candidacy

The dissertation topic may be proposed after the student has passed the qualifying examination. A doctoral student advances to candidacy after the dissertation topic has been approved by the student's advisory committee and the Dean of the Graduate School. Candidacy must be achieved at least six months before the degree is conferred.

Dissertation

The doctoral program of study must include 18 hours of dissertation credit. The doctoral candidate must be continuously enrolled in dissertation credit hours beginning with the semester after the dissertation topic is approved until the semester of graduation.

The dissertation must be submitted for final approval by the student's committee at least three weeks before the date of the final examination in which the dissertation is defended. Following the successful completion of this defense, the doctoral candidate must submit four unbound copies of the approved error-free manuscript to the Graduate School no later than the filing date indicated in the University calendar.

The Graduate School requires publication of the dissertation on microfilm and in *Dissertation Abstracts International* by University Microfilms International of Ann Arbor, Michigan. The student is responsible for paying the microfilming and optional copyrighting fees. Any other arrangements for publications of the dissertation must not interfere with publication by University Microfilms International.

Final Examination

Each candidate must pass a final examination over the contents of the dissertation. Sometimes called the "dissertation defense" or the "dissertation oral," this meeting is traditionally open to members of the University community. No student is permitted to take the final examination more than twice.

Ed.D. DEGREE REQUIREMENTS

The Doctor of Education (Ed.D.) degree is conferred by the University after the student has successfully completed all requirements in an approved doctoral program of study in the College of Education. Specific program degree requirements are described in the College of Education section of this *Catalog*.

Program of Study

Although the maximum amount of credit past the Master's of School Administration (M.S.A.) degree that an Ed.D. student may count towards a doctorate is 9 semester hours, **only educational administration courses approved by the program coordinator may be transferred.** This rule applies whether the courses were taken at UNC Charlotte or elsewhere; however, no more than six hours taken when the student was in post-baccalaureate (non-degree seeking) status may be applied toward the doctoral degree.

Time Limit

Candidates must complete all course work for the degree, including accepted transferred credit, within eight years from the time they first register as doctoral students. Courses that exceed this time limit must be revalidated or retaken, whichever the graduate program decides is necessary, if they are to be included in the degree program.

To revalidate a course, the student, along with the program coordinator, must prepare a revalidation plan that must be reviewed and approved by the Dean of the Graduate School. This plan often involves taking a special examination designed by the faculty of the graduate program. Once the plan has been completed, the program coordinator must notify the Dean of the Graduate School in writing.

Students may not revalidate a course with a grade of C or lower, courses that are internships or other forms of practica, or courses taken at other institutions.

GRADUATE CERTIFICATE REQUIREMENTS

The graduate certificate is awarded for successful completion of a coherent program of at least 12 credit hours proposed by a unit of the graduate faculty and approved by the Graduate Council. Students are admitted to a specific graduate certificate program and are advised by faculty in the unit offering the graduate certificate.

Since the graduate certificate is not a degree, students may apply the credits earned in the certificate program toward a degree that they pursue either in conjunction with the graduate certificate or after the certificate has been awarded.

Students may enroll in a graduate certificate program only or may complete the certificate in conjunction with a graduate degree program at the University. Hours taken toward a graduate certificate may be counted toward a graduate degree program with the consent of the graduate program coordinator.

Graduate certificate programs generally require at least 12 hours. Up to six hours taken at post-baccalaureate status at UNC Charlotte may be applied toward a certificate with the approval of the program coordinator. Although a student ordinarily may not transfer hours from another institution into a certificate program, some programs may allow up to six hours of transferred credit. The graduate certificate is awarded to a student who has completed the specified program of study with a GPA of 3.0 or better within four years from the time of enrollment in the first certificate course.

FAMILY EDUCATIONAL RIGHTS and PRIVACY ACT (FERPA) NOTIFICATION

The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. They are:

1) The right to inspect and review the student's education records within 45 days of the day the University receives a request for access.

Students should submit to the Registrar, dean, head of the academic department, or other appropriate official, written requests that identify the record(s) they wish to inspect. The University official will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the University official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed.

2) The right to request amendment of the student's education records that the student believes are inaccurate or misleading.

Students may ask the University to amend a record that they believe is inaccurate or misleading. They should write the University official responsible for the record, clearly identify the part of the record they want changed, and specify why it is inaccurate or misleading.

If the University decides not to amend the record as requested by the student, the University will notify the student of the decision and advise the student of his or her right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student's when notified of the right to a hearing.

3) The right to consent to disclosures of personally identifiable information contained in the student's education records, except to the extent that FERPA authorizes disclosure without consent.

One exception that permits disclosure without consent is disclosure to school officials with legitimate educational interests. A school official is a person employed by the University in an administrative, supervisory, academic or research, or support staff position (including law enforcement unit personnel and health staff); a person serving or company with whom the University has contracted (such as an attorney, auditor, or collection agent); a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks.

A school official has legitimate educational interest if the official needs to review an education record in order to fulfill his her professional responsibility.

4) The right to file a complaint with the U.S. Department of Education concerning alleged failures by UNC Charlotte to comply with the requirements of FERPA. The name and address of the Office that administers FERPA is: Family Policy Compliance Office, U.S. Department of Education, 600 Independence Avenue, SW, Washington, DC 20202.

UNC Charlotte intends to comply fully with these requirements. Policy Statement No. 69, "The Privacy of Educational Records," explains the procedures for compliance. Students may obtain copies of the Policy in the Office of the Registrar, and copies of the policy statement are available for inspection in the offices of each dean and department chair. The policy includes a list of the locations of all education records maintained by the institution.

The following categories of personally identifiable information about students have been designated as public or "directory" information which may be disclosed for any purpose without student consent: name, local and permanent address, telephone number, email address, date and place of birth, class, major field of study, dates of attendance, degrees and awards (including scholarships) received, participation in officially recognized activities and sports, and weight and height of members of an athletic team.

Currently enrolled students may withhold disclosure of information in any category by completing the appropriate form available in the Office of the Registrar. Written requests for non-disdosure will be honored for a maximum of one year, and all such requests will expire on the following August 31. UNC Charlotte assumes that failure to complete the request indicates approval for disclosure.

All questions concerning this policy on educational records may be directed to the attention of the Registrar.

ACCOUNTING

Degree
MACC, (Master of Accountancy)

Department of Accounting
259 Friday Building
(704) 547-2445
http://www.uncc.edu/macc

Coordinator
Dr. Jack Cathey

Graduate Faculty
Sak Bhamornsiri, Associate Professor
Alan Blankley, Associate Professor
Cindy Blanthorne, Assistant Professor
Hughlene Burton, Assistant Professor
Jack Cathey, Associate Professor
Michael Cornick, Associate Professor
Howard Godfrey, Professor
Robert Guinn, Associate Professor
Richard Schroeder, Professor
Casper Wiggins, Big Five Distinguished Professor

Program of Study
The Master of Accountancy program is a multiple track program designed to prepare accountants for the rapidly changing expectations of the profession. It provides for specialization in financial accounting/auditing and in tax. The program also includes the option for development of an individualized program of study. Completion of the program will enable students to pursue licensure in states requiring 150 semester hours.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Accounting:

1) Acceptable scores on the verbal and quantitative portions of the Graduate Management Admission Test.
2) Either a baccalaureate degree in accounting or the completion of the following prerequisite courses or their equivalents with a GPA of 3.0 or higher:
   - Intermediate Accounting (at least two semesters)
   - Cost Accounting
   - Introduction to Federal Taxation
   - Accounting Information Systems
   - Auditing

Students without an undergraduate degree in accounting from a U.S. University are encouraged to pursue an undergraduate degree in accounting prior to applying to the Master of Accountancy Program.

Degree Requirements
The program leading to the Master of Accountancy degree requires at least 30 hours of graduate credit, with a maximum of six hours of transfer credit accepted from another regionally accredited institution upon approval by the student's adviser and the Dean of the Graduate School. A 3.0 GPA is required in all courses taken for graduate credit and a maximum of two C's is permitted for continuation in the program. The residence requirement is satisfied by completion of at least three-fourths of the required courses while in residence. Neither a comprehensive examination nor a thesis is required.

The Master of Accountancy degree consists of 30 semester hours (10 graduate classes) of course work. The 30 hours are divided into two components: accounting classes and non-accounting elective classes.

Admission to Candidacy Requirements
An Admission to Candidacy form listing graduate-level course that apply to the degree must be submitted to the Graduate Coordinator one month prior to the semester in which the student plans to complete the course work for the degree.

Assistantships
Assistantships are available on a limited and competitive basis.

Accounting Program Tracks
Financial Accounting/Auditing Track
The Financial Accounting/Auditing track is designed for students wishing to pursue careers in public accounting, consulting, and corporate accounting. The track is also appropriate for students who are interested in a broad exposure to accounting at the graduate level. The program is offered primarily during the daytime with limited offerings in the evening.

The required classes for this track are:

ACCT 6210	Advanced Accounting Information Systems
ACCT 6220	Advanced Auditing
ACCT 6230	Advanced Managerial Accounting
ACCT 5230	Advanced Income Tax
ACCT 6250	Accounting Theory and Practice

In addition to the required classes a student is expected to complete five elective classes with at least three of the electives outside of the field of accounting. In addition to the accounting classes listed above, ACCT 5111 - Advanced Financial Accounting and ACCT 5112 - Financial Reporting for Not for Profit Entities, are available as accounting electives.

Tax Track

The Tax track is designed for students who wish to specialize in taxation. The program is offered in the evening and is designed to permit both full-time and part-time study.

The required classes for this track are:

ACCT 6110	Tax Research, Planning and Practices
ACCT 6120	Taxation of Corporations and Shareholders
ACCT 6130	Taxation of Partnerships and S Corporations
ACCT 6140	Taxation of Estates, Gifts, and Trusts
ACCT 6150	Business Tax Strategies

In addition to the required classes a student is expected to complete five elective classes with at least three of the electives outside of the field of accounting and taxation.

Individualized Track

The Individualized Track is designed for students with unique career and professional goals that are not met by the other tracks. Consultation with the Graduate Coordinator is recommended for this track.

Advising

Prior to, or concurrent with, the first semester of study each student will be expected to complete a program of study listing each class the student expects to take as a part of the program.

Application for Degree

An Application for Degree form must be completed and submitted with the graduation fee to the Registrar's Office by the published deadline.

Program Certifications/Accreditation

The Belk College of Business Administration and the Department of Accounting are accredited by the American Association of Collegiate Schools of Business (AACSB).

COURSES IN ACCOUNTING

ACCT 5111. Advanced Financial Accounting. (3) Advanced concepts and practices in financial reporting with special emphasis on business combinations and consolidated financial statements. In addition, the course will examine current topics and emerging issues. *(Spring)*

ACCT 5112. Financial Reporting for Not for Profit Entities. (3) An exploration of the financial reporting issues and practices for governmental and other not-for-profit entities. In addition, the course will examine current topics and emerging issues. *(Fall)*

ACCT 5230. Advanced Income Tax. (3) An examination of advanced tax topics regarding corporations, partnerships, and individuals. In addition, estate and gift, fiduciary accounting, tax-exempt entities and retirement plans will be examined at an introductory level. *(Spring)*

ACCT 6110. Tax Research and Planning. (3) Tax research techniques applicable to federal tax law affecting individuals, corporations and partnerships, including use of traditional and computerized tax services to solve tax problems. Emphasis on tax planning principles and related tax practice matters, including handling tax compliance issues and dealing with the Internal Revenue Service. *(Fall)*

ACCT 6120. Taxation of Corporations and Shareholders. (3) Co/Prerequisite: ACCT 6110. This course examines the federal and state tax law applicable to corporations and their shareholders. The course covers tax compliance matters, strategies for minimizing tax liabilities and strategies for handling tax controversies. *(Fall)*

ACCT 6130. Taxation of Partnerships and S Corporations. (3) Prerequisite: ACCT 6110. Tax law applicable to partnerships and S corporations, including tax compliance matters strategies for minimizing tax liabilities and strategies for handling tax controversies. *(Spring)*

ACCT 6140. Taxation of Estates, Gifts, and Trusts. (3) Prerequisite: ACCT 6110. Wealth transfer taxes and taxation of estates and trusts, including integration of these taxes and tax planning opportunities for minimizing tax liabilities. *(Summer)*

ACCT 6150. Business Tax Strategies. (3) Prerequisite: consent of program coordinator. Tax strategies in all phases of business operations, including creation of the business, choice of the type of business entity, financing, operations, distributions to owners, expansion, reorganization and liquidation with emphasis on minimizing taxes and avoid tax traps. Analysis of business planning cases and completion of a comprehensive project with the results presented in both an oral and written report. *(Spring)*

ACCT 6210. Advanced Accounting Information Systems. (3) Documentation and evaluation of current accounting information systems, evaluation of potential new systems, to extract data from existing systems from analysis, and examination of emerging technologies which have potential uses in accounting information systems. *(Fall)*

ACCT 6220. Advanced Auditing. (3) Audit practice, including the role of auditors in society, a study of legal liability issues, the theory of audit evidence, and analysis of internal control systems (including EDP), a review of audit regulations and ethics and the interpretation of audit reports. *(Fall)*

ACCT 6230. Advanced Managerial Accounting. (3)
This course covers advanced concepts and practices in managerial accounting including activity-based cost systems, activity-based management, theory of constraints, transfer pricing, and performance measurement using the balanced scorecard. *(Fall)*

ACCT 6250. Accounting Theory and Practice. (3)
Prerequisite: consent of program coordinator. Financial accounting theory and practice, including research techniques, analytical skills, communication skills, professional judgment, international and ethics issues. *(Spring)*

ARCHITECTURE

Degree
M.Arch.

College of Architecture
Storrs Architecture Building
(704) 547-2358

Program Coordinator
Peter Wong

Program Description
The Master of Architecture degree (M.Arch.) serves two groups of students: 1) the three and one half year M.Arch. I Program accommodates students whose previous degree is outside the field of architecture; and 2) the two-year M.Arch. II Program serves students who have already completed a four or five-year degree program in architecture at a National Architectural Accrediting Board (NAAB) accredited institution. The courses and options within the program are similar in both programs, but the advanced standing of M.Arch. II students allows them to complete the degree requirements in two years. Students in both programs must complete a comprehensive design project or a thesis project under the advisement of a faculty committee. Full time academic status is strongly recommended during study in both programs.

The M.Arch. I Program involves four components: 1) the first year focuses on establishing a strong foundation in fundamental design skills, architectural history and theory, and introductory building technologies; 2) the second year concentrates on architectural design and its relationship to building systems as well as more advanced studies in history, theory, and building technology; 3) a summer study program provides the opportunity to engage international education, research, or professional cooperative practice experience; and 4) the third year is dedicated to the student's architectural design projects or thesis research.

The M.Arch. II Program is tailored through the advising process to the previous educational background of the students and to their individual professional and research goals. The two primary components are 1) a first year which focuses on architectural building design and topical studio sand its relationship to building systems as well as more advanced studies in history, theory; and 2) the second year is dedicated to individual student architectural design projects or thesis research.

Degree Requirements

M.Arch. I Curriculum
The M.Arch. I Program requires a minimum of 92 hours to be completed during three academic years and one summer session.

Year 1 - Fall - 14 hours
- ARCH 6111 Studio (Design Fundamentals/Skills) (7)
- ARCH 5211 Architectural History I (3)
- ARCH 6231 Readings in History/Theory I (1)
- ARCH 6050 Architectural Elective (3)

Spring - 16 hours
- ARCH 6112 Studio (Design Fundamentals/Skills) (6)
- ARCH 5212 Architectural History II (3)
- ARCH 6232 Readings in History/Theory II (1)
- ARCH 6135 Architectural Theory (3)
- ARCH 5312 Architectural Materials (3)

Year 2 - Fall - 14 hours
- ARCH 7101 Studio (Building Design) (5)
- ARCH 5213 History/Theory Elective (3)
- ARCH 5313 Structures I (3)
- ARCH 5315 Environmental Control Systems (3)

Spring – 14 hours
- ARCH 7102 Studio (Urban/Topical) (5)
- ARCH 5214 History/Theory Elective (3)
- ARCH 5314 Structures II (3)
- ARCH 6151 Design Methodology (3)

Summer - 6 hours
- ARCH 7110 Summer Study Program (6)

Year 3 - Fall - 14 hours
- ARCH 7103 Studio (Topical) (5)
- ARCH 7111 Research Document (3)
- ARCH 5317 Building Systems Integration (3)
- ARCH 6050 Architectural Elective (3)

Spring - 14 hours
- ARCH 7104 Comprehensive Architectural Project/Thesis Studio (8)
- ARCH 5112 Professional Practice (3)
- Interdisciplinary Elective (3)

Total hours – 92

M. Arch. II Curriculum
The M.Arch. II Program requires a minimum of 44 credit hours to be completed during two academic years. If accepted applicants are evaluated and found deficient in entry level competencies, then they will be required to enroll in additional course work beyond the 44 credits to complete their degree. Below is a list of some of the course work offered by the College of Architecture which fulfills these competencies.

Expected Entry Level Competencies for M.Arch. II Candidate::
History/Theory equal to ARCH 5213
History/Theory Seminar (3)
History/Theory equal to ARCH 5214
History/Theory Seminar (3)
Building Technology equal to ARCH 5314
Structures II (3)
Building Technology equal to ARCH 5315
Environmental Control Systems (3)

To ensure that incoming students are evaluated appropriately, the College of Architecture requires candidates for the M.Arch. II program to furnish the Architecture Graduate Admissions Committee and Graduate Program Coordinator relevant course descriptions and syllabi of all architecture courses passed and completed which may satisfy entry level competencies in Design, History, Theory, Materials, Structures, Environmental Control Systems, Design Methods, and Professional Practice Students admitted to the program who require additional course work will be advised appropriately. The following curriculum is modeled for students accepted to the program who have satisfied all entry level competencies.

Year 1 - Fall - 11 hours
ARCH 7101 Studio (5)
ARCH 5317 Building Systems Integration (3)
ARCH 6050 Architectural Elective (3)

Spring - 11 hours
ARCH 7102 Studio (Urban/Topical) (5)
ARCH 6151 Design Methodology (3)
ARCH 6050 Architectural Elective (3)

Summer - 6 hours
ARCH 7110 Summer Study Program (6)
Optional: Replaces 6 credit hours of architectural elective credits

Year 2 - Fall - 11 hours
ARCH 7103 Studio (Topical) (5)
ARCH 7111 Research Document (3)
ARCH 6050 Architectural Elective (3)

Spring - 11 hours
ARCH 7104 Architectural Project/Thesis Studio (8)
ARCH 5112 Professional Practice (3)
Total hours - 44

Graduate Advising
It is important that all graduate students receive academic advising. Critical components of any successful graduate program are academic advising and guidance during the course of a student's program of study. Primary advising roles will be with the Graduate Program Coordinator. Students who enter their final year will be asked to complete a final plan of study, and will be asked to identify possible committee members from the faculty to serve as advisors for their final project.

Transfer Credit
Transfer credit is not normally allowed because of the nature of the program. However, a maximum of six credits may be transferred if a student can demonstrate that the replacement courses meet or exceed the level of graduate curricula offered by the College.

Assistantships, Tuition Differentials, and Scholarships
A limited number of teaching assistantships and tuition waivers are available to both M.Arch. I and II candidates. Awards are strictly based on the applicant's academic merit and promise.

National Architectural Accrediting Board
In the United States, those who want to practice architecture must be registered and licensed in any state they seek to practice architecture. Many states, including North Carolina, have adopted the requirement that any architect must first obtain a professional degree in architecture accredited by the National Architectural Accrediting Board (NAAB). Following the completion of a professional degree program accredited by the NAAB, the future architect must serve three years of internship working for a registered architect. (Note: A portion of this time may be completed as a student when enrolled at a NAAB accredited school of architecture.) The NAAB defines an accredited degree as such:

In the United States, most state registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit U.S. professional degree programs in architecture, recognizes two types of degrees: the Bachelor of Architecture and the Master of Architecture. A program may be granted a five-year, three-year, or two-year term of accreditation, depending on its degree of conformance with established educational standards.

Masters degree programs may consist of a pre-professional undergraduate degree and a professional graduate degree, which when earned sequentially, comprise an accredited professional education. However, the pre-professional degree is not, by itself, recognized as an accredited degree.

The NAAB grants candidacy to new programs that have developed viable plans for achieving initial accreditation. Candidacy status

indicates that a program should be accredited within six years of achieving candidacy, if its plan is properly implemented.

The M.Arch. degree for M.Arch. I and M.Arch. II students at the College of Architecture was first established in 1997. In the spring of 2000, these programs were reviewed for "candidacy status" by the NAAB. In the year 2001, the NAAB will return to review both programs for accreditation as a professional M.Arch. degree.

COURSES IN ARCHITECTURE

Studio Courses:

ARCH 6111. Design Fundamentals/Skills. (7) Introductory architectural design studio which focuses on the acquisition and practice of technical and graphic skills. *(Fall)*

ARCH 6112. Design Fundamentals/Skills. (6) Prerequisite: ARCH 6111. Introductory architectural design studio which focuses on the acquisition and practice of a variety of technical and graphic skills, as well as the development of site, space, and design process issues. *(Spring)*

ARCH 7101. Building Design Emphasis Studio. (5) Prerequisite ARCH 6112. Design studio focusing on site specific projects emphasizing technological and systemic issues which lead toward comprehensive building designs. *(Fall)*

ARCH 7102. Urban Emphasis/Topical Studio. (5) Prerequisite: ARCH 7101. Design studio focusing on site specific building design projects with an emphases on urban and/or topical issues. *(Spring)*

ARCH 7103. Topical Studio. (5) Prerequisite: ARCH 7102. Architectural studio with an emphasis on topical issues. *(Fall)*

ARCH 7104. Comprehensive Architectural Design Project/Thesis Studio. (8) Prerequisite: ARCH 7103 or equal. Individualized comprehensive design project or thesis research project advised by the faculty. *(Spring)*

Architectural History/Theory Courses:

ARCH 5211. Architectural History I. (3) Survey of the theoretical, technical, and cultural background of architecture and urban design from prehistory to 1750. *(Fall)*

ARCH 5212. Architectural History II. (3) Prerequitsite: ARCH 5211. Survey of the theoretical, technical, and cultural background of architecture and urban design from 1750 to present. *(Spring)*

ARCH 5213. History/Theory Elective. (3) Prerequisite: ARCH 5212 or permission of instructor. Study of topical areas of history and theory in architecture. These courses are required and complement the survey courses (ARCH 5211 and 5212) to develop in-depth research, writing, and presentation skills. *(Fall)*

ARCH 5214. History/Theory Elective. (3) Prerequisite: ARCH 5213, or permission of instructor. Study of topical areas of history and theory in architecture. These courses are required and complement the survey courses (ARCH 5211 and 5212) to develop in-depth research, writing, and presentation skills. *(Spring)*

ARCH 6231. Readings in History/Theory I. (1) Corequisite: ARCH 5211. Seminar on readings from theory of the period being covered in accompanying survey course. *(Fall)*

ARCH 6232. Readings in History/Theory II. (1) Corequisite: ARCH 5212. Seminar on readings from theory of the period being covered in accompanying survey course. *(Spring)*

ARCH 6135. Architectural Theory. (3) History of ideas and intellectual thought in architectural discourse. *(Spring)*

Building Technology Courses:

ARCH 5312 Architectural Materials. (3) This course introduces the quantitative and qualitative characteristics of architectural materials, systems, and processes. Students will be introduced to the physical properties of materials relevant to their application in construction, assembly, and detail systems. Topics will include masonry, concrete, wood, steel, glass, cladding, and roofing and flooring materials and their assemblies. *(Spring)*

ARCH 5313. Structures 1. (3) Prerequisite ARCH 5312. This course introduces issues relevant to the fundamentals of structures including statics, strength and stability of materials. Students will be introduced to structural concepts, systems, and the tracing of structural loads through basic principles, physical modeling, and theoretical and analytical methods. Topics will include interrelationship between strain, stress, and stability, as well as the implications of tension, compression, shear, torsion, and bending. *(Fall, Summer)*

ARCH 5314. Structures 2. (3) Prerequisite: ARCH 5313. This course introduces specific structural applications of wood, steel, concrete, and masonry systems commonly used in small-scale commercial/institutional buildings. Students will be introduced to the design of beams, columns, walls, joinery, and connections appropriate to each material type through theoretical, analytical, and computer simulation methods. *(Spring, Summer)*

ARCH 5315. Environmental Control Systems. (3) Prerequisite ARCH 5312 and corequisite ARCH 5313. This course introduces qualitative and quantitative

analytical methods commonly used to assess the impact of environmental forces on occupant thermal and luminous comfort, energy performance, and regional sustainability. Students will be introduced to the interplay between climatic events, patterns of building use, and the architectural variables that inform the appropriate application of building systems technology. Topics will include building envelope performance, and the introduction of passive and mechanical systems for heating, cooling, illuminating, and ventilating buildings. *(Fall, Summer)*

ARCH 5317. Building Systems Integration. (3) Prerequisites: ARCH 5314 and ARCH 5315. This course will introduce a set of advanced issues related to the comprehensive, systemic integration of building technology systems commonly used in large-scale buildings through case study, analytical, and simulation methods. Topics will address the resolution of building structure, materials, environmental systems, mechanical systems, electrical systems, life safety, building water supply and waste, and conveying systems in building design. *(Fall)*

Required Architectural Courses:

ARCH 5112. Professional Practice. (3) Introduction to the objectives of the practice of architecture, its responsibilities and procedures, and emerging alternative forms of practice and as they pertain to the role of the architect. *(Spring)*

ARCH 6151. Design Methodology. (3) Examination of analytic and synthetic models including information processing, programming, and implementation activities used to structure the architect's design process; conjectural models and methods specific to the architect's creative skills. *(Spring)*

ARCH 7110. Summer Study Program. (6) Students choose from three summer study options: 1) participation in an off-campus study program; 2) participation in a summer professional practice cooperative; and 3) engage funded research on a specific topic related to architecture. (Summer)

ARCH 7111. Research Document. (3) Documentation of case studies, programmatic criteria, procedures, methods, and research in preparation for ARCH 7104. (Fall)

Architectural Elective Courses:

ARCH 6050. Architecture Elective. (3) Concentrated, in-depth study on a specialized topic. *(Fall, Spring, Summer)*

ARCH 6890. Directed Independent Study (3) Prerequisite: permission of a graduate faculty member advising the study and the Graduate Coordinator. Directed individual study and in-depth analysis of a special area related to the interests of the student and the expertise of advising faculty member. *(Fall, Spring, Summer)*

BIOLOGY

Degrees
M.S., M.A., Ph.D.

Coordinators
Dr. Stanley S. Schneider – Master's coordinator
Dr. Michael C. Hudson – Doctoral coordinator

BIOLOGY
Master of Science Degree

The Master of Science degree program is designed for students who desire to pursue advanced studies in professional and graduate schools or various vocational opportunities in biology and related areas. The program provides the opportunity for broad training in a variety of biological areas as well as specialization in areas of particular interest to the student. The department is organized into three interest groups reflecting the strengths and research activities of the faculty: Microbiology/ Biotechnology, Cellular/Biomedical, and Ecology/ Environmental. Students may choose one of these as their area of specialization. Also, an arrangement with Carolinas Medical Center in Charlotte allows students to conduct their graduate research at this facility under the direction of one of the hospital staff.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following requirements are specific to the Department of Biology:

1) Evidence of undergraduate preparation in biology with a minimum 24 semester hours in biology and 24 semester hours of cognate study.
2) A satisfactory score on the general portions of the Graduate Record Examination.

Degree Requirements
The program leading to the Master of Science degree in Biology requires the successful completion of 30 semester hours of course work approved by a supervisory committee. At least 16 of these hours, including no more than eight hours of thesis research, must be in courses open to graduate students only. In addition to course work, each degree candidate must pass an oral candidacy examination. The candidate must also prepare, present and defend a thesis based upon original research acceptable to the Supervisory Committee and the Dean of the Graduate School.

Admission to Candidacy
General academic regulations will apply to application for admission to candidacy. In addition to these the applicant should have:
1) Removed any identified entrance deficiencies by the time of application.
2) Successfully completed the candidacy examination.
3) Taken at least 15 hours of graduate work with a GPA of 3.0 or better.
4) Satisfied the supervisory committee that he/she is qualified to become a candidate, i.e., can fulfill the requirements successfully.

Assistantships
Teaching and research assistantships are available on a competitive basis for qualified students. A limited number of out-of-state and in-state tuition grants are also competitively awarded.

BIOLOGY
Master of Arts Degree

The Master of Arts degree program is designed for students who choose to write a thesis based upon published scientific literature rather than on laboratory or field research.

Degree Requirements
Students who choose to pursue the Master of Arts degree must complete the requirements for the Master of Science degree with the following exceptions: at least 32 hours of course work, including two hours of Seminar are required. A maximum of four hours of credit for thesis research may be included in the required 32 hours, and three courses of the 32 hours submitted for the degree must include a formal laboratory.

BIOLOGY
Interdisciplinary Doctoral Program
(Biomedical Science and Biotechnology)

The Interdisciplinary Ph.D. in Biology Program has as its intellectual focus a synthesis of the molecular and integrative bases of biomedical sciences and related biotechnology. In addition to a vigorous research concentration, the program emphasizes the importance of relevant course work. All students are required to complete a series of core courses that stress the interdisciplinary nature of the program. These courses expose students to the biological, chemical, physical, and engineering aspects of biotechnology and to the ethical implications of biomedical and biotechnological research. The cornerstone of the program is the student's research dissertation. Each dissertation is expected to be a significant scientific contribution based on independent and original research, leading to publications in national/international peer-reviewed journals.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following are required for study toward the Interdisciplinary Ph.D. in Biology.
Under most circumstances, students admitted to the program will have:
1) A B.S. or B.A. degree from an accredited university.
2) An overall grade point average of at least 3.0 out of 4.0. Additionally, applicants must have a grade point average of at least 3.5 in biology, 3.0 in chemistry, and 3.0 in mathematics.
3) A score on the Graduate Record Examination General Test in at least the 65th percentile (average for the verbal, quantitative, and analytical sections).
4) A minimum of 24 hours in biology, which must include at least one course in each of the areas of genetics, physiology, and cell/molecular biology. Additionally, applicants must have one year each of general chemistry, organic chemistry, physics, and mathematics (at least one semester each of calculus and statistics). Applicants with academic deficiencies may be admitted on the condition that any deficiencies are corrected during the first year of graduate study. The Interdisciplinary Ph.D. Committee will determine the remediation necessary for identified deficiencies.
5) A score of at least 550 in the Test of English as a Foreign Language (TOEFL) for applicants whose native language is not English. Students who do not pass this examination must pass ENGL 1100 (English as a Foreign Language) with a grade of C or higher. In addition, these students who will be involved in any instructional activity (e.g., teaching assistants) will be required to be evaluated by the English Language Training Institute at UNC Charlotte prior to the beginning of the first semester of study.
6) Three letters of reference, at least two of which must be from faculty members

Degree Requirements
The Ph.D. acknowledges the value of course work as background and preparatory for research, but the primary emphasis of the program is on the development of research skills and the completion of a research project on a significant problem in the area of biomedicine or biotechnology.

1. Total hours required.
The program requires 72 post-baccalaureate credit hours. Because of the interdisciplinary nature of this program, all students will be required to take a general curriculum that includes a two-year sequence of core courses as shown below:

Year 1: Core A:
16 semester hours. Team-taught series of half-semester course modules, including Principles of Biochemistry, followed by Molecular and Cell Biology, Microbiology and Immunology, and Integrative Systems Physiology. These modules will provide the fundamental background for the applied focus of the program.

Year 2: Core B:
10 semester hours. Four team-taught semester-long courses in Biophysics (Fall, 3 credits), Bioethics (Fall, 1 credit), Biotechnology and Bioengineering (Spring, 3 credits), and Advanced Biochemistry (Spring, 3 credits). These courses will build on the material presented in Core A and will emphasize the chemistry, physics, and engineering principles as they impact biomedicine and biotechnology.

Years 1-4:
Interdisciplinary Colloquium; 4 semester hours (1 hour per year). This course brings together faculty and students from the participating programs in an informal discussion of interdisciplinary research. (Fall semester only).

Years 1-4:
Seminar; 4 semester hours (1 hour per year). Formal student presentations of current literature topics in their area of study. (Spring semester only).

Years 1 & 2:
Laboratory Research Rotations; 6 semester hours total (3 rotations of 2 hours each). These hours may be earned entirely in Year 2, or begun in Year 1 and completed in Year 2.

Years 2 & 3:
Electives; 8 semester hours minimum. Advanced topics courses to be selected by students in consultation with their dissertation committee. These will be specialty topics in the areas of expertise of program faculty.

2. Proportion of courses open only to graduate students.
All the basic core courses, interdisciplinary colloquium, and seminar classes are open to graduate students only. Lab rotations are restricted to doctoral students. At least 4 hours of the minimum 8 hours of electives must be in courses at the 8000 level or higher. The remaining 4 credit hours can be completed in any approved program electives.

3. Grades required.
A student must maintain a cumulative average of 3.0 in all course work taken for graduate credit. Lab rotations and the dissertation research will be graded on a Pass/Unsatisfactory basis and therefore will not be included in the cumulative average. An accumulation of two C grades will result in termination of the student's enrollment in the graduate program. If a student makes a grade of U in any course, enrollment in the program will be terminated.

4. Amount of transfer credit accepted.
Only courses with grades of A or B may be accepted for transfer credit. Although the maximum amount of credit past the baccalaureate degree that a Ph.D. student may count towards the doctorate is 30 semester hours, only courses appropriate for the program and curriculum in which the student is enrolled may be transferred. This should be determined by the student's Dissertation Committee and approved by the program coordinator, before the request is submitted to the Graduate School. This rule applies whether the courses were taken at UNC Charlotte or elsewhere, and whether a master's degree was earned or not. However, no more than six hours taken when the student was in post-baccalaureate (non-degree seeking) status may be applied toward the doctoral degree.

5. Photography workshop.
All students will be required to take the photography workshop offered by the Department of Biology.

6. Departmental seminars.
Graduate students are expected to attend all seminars sponsored by the Department of Biology.

7. Advancement to candidacy.
For Advancement to Candidacy, a student must complete the following by the end of the 5th semester of study. First, the student must pass the Candidacy Examination. A dissertation topic will then be proposed to the student's Dissertation Committee. A student advances to candidacy following approval of the proposed dissertation topic by the student's Dissertation Committee and the Dean of the Graduate School.

8. Dissertation.
The doctoral program of study must include a minimum of 18 hours of dissertation credit. The student must complete and defend a dissertation based on a research program approved by the student's dissertation committee which results in a high quality, original and substantial piece of research. The student must orally present and successfully defend the dissertation to the student's dissertation committee in a defense that is open to the public. A copy of the dissertation must be made available for review by the program doctoral faculty at least two weeks prior to the public defense.

9. UNC Charlotte residency requirement.
The student must satisfy the UNC Charlotte residency requirement for the program by completing 20 hours, either as course work or research credits. Residence is considered to be continuous if the student is enrolled in one or more courses in successive semesters until 20 hours are earned.

10. Laboratory research rotations.
Laboratory research rotations allow the student to sample areas of research and become familiar with program faculty. Each student is to complete three rotations, each of two hours of course credit, during the first two years of the program. The three rotations must be done in at least two different departments.

11. Time limits for completion.
All requirements for the degree must be completed within eight years after first registration as a doctoral student. The student must achieve admission to candidacy within six years after admission to the program and complete all requirements within six years after admission to candidacy for the Ph.D. degree. These time limits are maximums; students will typically be expected to complete the degree requirements within five years.

COURSES IN BIOLOGY

BIOL 5000. Advanced Topics in Biology. (1-4) Courses in selected topics and advanced studies in biology. Lecture and laboratory hours will vary with the topics taught. May be repeated for credit as topics vary. *(Fall, Spring)*

BIOL 5110. Methods in Biological Electron Microscopy. (3) A laboratory-oriented course in the methodology and applications of transmission and scanning electron microscopy. Two laboratory periods of three hours each a week and three additional laboratory hours. *(Fall)*

BIOL 5111. Evolution. (3) Theories of evolution and forces which affect gene frequencies. *(Fall)*

BIOL 5121. Biometry. (4) Prerequisite: one course in statistics. Design and analysis of experiments. Three lecture hours and one laboratory period of three hours a week. *(Spring)*

BIOL 5144. Advanced Ecology. (4) Energy flow, nutrient cycles, community structure, population growth and regulation. Three lecture hours and one laboratory period of three hours a week. *(Fall)*

BIOL 5149. Limnology and Oceanography. (4) Geological, physical, chemical and biological aspects of lakes, streams, estuaries and oceans. Three lecture hours and one laboratory period of three hours a week. *(Fall)*

BIOL 5168. Recombinant DNA Techniques. (3) Modern molecular biological methods (such as DNA cloning, gel electrophoresis, nucleic acid hybridization, PCR, and DNA sequencing) data analysis and interpretation. One lecture hour and two laboratory periods of three hours a week. *(Fall)*

BIOL 5171. Cell Physiology. (3) The fundamental physicochemical properties of cells. *(Fall)*

BIOL 5184. Plant Biotechnology. (3) A laboratory-oriented course designed to integrate plant molecular biology, recombinant DNA technology, and plant cell and tissue culture. One lecture hour and two laboratory periods of three hours a week. *(Spring) (Alternate years)*

BIOL 5189. Mechanisms in Development. (3) Cellular and molecular bases of differentiation; an exploration of the experimental analysis of causal and controlling factors in development. *(Spring)*

BIOL 5199. Molecular Biology. (3) Structural and functional interaction of nucleic acids and proteins in the replication, transcription and translation of genetic material. *(Fall)*

BIOL 5205. Advanced Horticulture. (3) Topics in ornamental horticulture and landscaping, including greenhouse projects and field trips. Two lecture hours and three hours of lab a week. *(Spring)*

BIOL 5221. Plant Systematics. (4) Identification and classification of vascular plants, including experimental concepts of speciation. Three lecture hours and one laboratory period of three hours a week. *(Spring)*

BIOL 5223. The Fungi. (3) Morphology, life cycles, ecology, taxonomy, and medical economic significance of the fungi and organisms historically aligned with the fungi. *(On demand)*

BIOL 5223L. The Fungi Laboratory. (1) Co-requisite/prerequisite: BIOL 5223; Consent of department for graduate credit. One laboratory period of three hours a week. *(On demand)*

BIOL 5229. Dendrology. (4) The identification, structure, function, ecology, reproduction, and evolutionary relationships of woody plants. Three lecture hours and one three-hour lab a week. *(Fall)*

BIOL 5233. Parasitology. (4) Morphology, life cycles, ecology, taxonomy and economic importance of parasites. Three lecture hours and one laboratory period of three hours a week. *(Spring)*

BIOL 5234. Wildlife Biology. (3) Concepts, principles and techniques of wildlife biology. Identification and life histories with emphasis on the value, study attraction, management, conservation and control of wildlife species. *(On demand)*

BIOL 5234L. Wildlife Biology Laboratory. (1) Prerequisite or corequisite: BIOL 5234. One laboratory period of three hours a week plus field trips. *(On demand)*

BIOL 5235. Mammalogy. (4) Taxonomy, anatomy, physiology and life histories of the mammals. Three lecture hours and one laboratory period of three hours a week. *(Fall)*

BIOL 5243. Animal Behavior. (3) An ethological approach to how animals respond to their environment. Causation, development and adaptive significance of behavior in social systems. *(Fall)*

BIOL 5243L. Animal Behavior Laboratory. (1) Prerequisite or corequisite: BIOL 5243. One laboratory period of three hours a week. *(Fall)*

BIOL 5244. Conservation Biology. (3) Conservation values, extinction rates, genetic diversity, demography, habitat fragmentation, reserve management, ecological restoration. *(Yearly)*

BIOL 5244L. Conservation Biology Laboratory. (1) Prerequisite or corequisite: BIOL 5244. One laboratory period of three hours a week plus field trips. *(Yearly)*

BIOL 5250. Microbiology. (3) Morphology, physiology, pathogenicity, metabolism and ecology of micro-organisms. *(Fall)*

BIOL 5250L. Microbiology Laboratory. (1) Prerequisite or corequisite: BIOL 5250. One laboratory period of three hours a week. *(Fall)*

BIOL 5251. Immunology. (3) Cellular, molecular and genetic basis for immunity; physical chemistry of antigens and antibodies and their interactions; defense mechanisms. *(Spring, Summer)*

BIOL 5251L. Immunology Laboratory. (1) Prerequisite or corequisite: BIOL 5251. One laboratory period of three hours a week. *(Spring)*

BIOL 5252. Monoclonal Antibodies/Production and Purification. (3) A laboratory-oriented course devoted to the theory and procedures for the production and utilization of monoclonal antibodies and the associated techniques for protein isolation and characterization. One lecture hour and two laboratory periods of three hours a week. *(Fall)*

BIOL 5253. Marine Microbiology. (4) Bacteria, fungi and viruses of marine origin, and their response to the salt, temperature, pressure and nutrient environment of the ocean. Roles of marine microorganisms in public health, pollution and fouling. Three lecture hours and one laboratory period of three hours a week. *(Spring)*

BIOL 5254. Epidemiology. (3) History and practices of epidemiology with emphasis on modes of transmission of clinically important infectious agents and the analysis of epidemiological data. Three lecture hours a week. *(On demand)*

BIOL 5255. Bacterial Genetics. (3) Regulation of gene expression in bacterial systems. Bacteriophage genetics. DNA transfer in bacteria. *(Spring)*

BIOL 5256. Pathogenic Bacteriology. (3) Cellular and molecular interactions of mammalian hosts with procaryotic parasites. *(Spring)*

BIOL 5256L. Pathogenic Bacteriology Laboratory. (1) Prerequisite: BIOL 5250L One laboratory period of three hours a week. *(Spring)*

BIOL 5257. Microbial Physiology and Metabolism. (4) A laboratory-oriented course covering such topics in general microbiology as the preparation and use of cell-free systems, isolation of auxotrophs, transport mechanisms, etc. Lectures in microbial metabolism and physiology and reading on recent development in microbiology. Two, one-hour lectures and two, two-hour laboratory periods per week. *(Spring)*

BIOL 5259. Virology. (3) Morphology, classification, genetics and pathogenicity of bacterial and animal viruses. *(Fall)*

BIOL 5259L. Virology Laboratory. (1) Prerequisite or corequisite: BIOL 5259. One laboratory period of three hours per week. *(Fall)*

BIOL 5260. Population Genetics (3) The genetics of qualitative and quantitative traits in populations, including an assessment of the factors affecting the extent and pattern of the genetic variation in these traits. *(On demand)*

BIOL 5277. Endocrinology. (3) Endocrine glands and their physiological roles in metabolism, growth and reproduction. *(On demand)*

BIOL 5277L. Endocrinology Laboratory. (1) Prerequisite or corequisite: BIOL 5277. One laboratory period of three hours a week. *(On demand)*

BIOL 5279. Neurobiology. (3) Physiology and anatomy of nervous systems, especially mammalian. *(Spring)*

BIOL 5279L. Neurobiology Laboratory. (1) Prerequisite or corequisite: BIOL 5279. One laboratory period of three hours a week. *(Spring)*

BIOL 5282. Developmental Plant Anatomy. (3) Study of plant cells, tissues, organs and patterns of growth and differentiation. *(Spring)*

BIOL 5282L. Developmental Plant Anatomy Laboratory. (1) Prerequisite or corequisite: BIOL 5282. One laboratory period of three hours a week. *(Spring)*

BIOL 5283. Animal Development. (3) Developmental processes occurring chiefly during gametogenesis, fertilization, early embryogenesis and organogenesis. *(Fall)*

BIOL 5283L. Animal Development Laboratory. (1) Prerequisite or corequisite: BIOL 5283. One laboratory period of three hours a week. *(Fall)*

BIOL 5291. Histology. (4) Animal tissues and organs; techniques of preparing tissues for analysis. Three lecture hours and one laboratory period of three hours a week. *(Spring)*

BIOL 5292. Advances in Immunology. (3) Current topics in immunology with particular emphasis upon the genetic systems and molecular mechanisms underlying immune reactions. *(Fall)*

BIOL 5293. Comparative Vertebrate Anatomy. (4) Prerequisite: BIOL 2111. Comparative studies of the anatomy, physiology and functional adaptations of selected vertebrates with emphasis on evolutionary developments, especially in mammals. Three lecture hours and one laboratory period of three hours a week. *(Spring)*

BIOL 6000. Special Topics in Biology. (1-4) Prerequisite: consent of department. Courses in selected topics and advanced studies in biology. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6010. Special Topics in Microbiology. (1-4) Prerequisite: consent of department. Advanced courses in microbiology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6020. Special Topics in Systematic Biology. (1-4) Prerequisite: consent of department. Advanced courses in systematic and evolutionary biology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6030. Special Topics in Genetics. (1-4) Prerequisite: consent of department. Advanced courses in genetics. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6040. Special Topics in Molecular Biology. (1-4) Prerequisite: consent of department. Advanced courses in biochemistry and molecular biology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6050. Special Topics in Physiology. (1-4) Prerequisite: consent of department. Advanced courses in physiology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6060. Special Topics in Developmental Biology. (1-4) Prerequisite: consent of department. Advanced courses in developmental biology and embryology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6070. Special Topics in Anatomy. (1-4) Prerequisite: consent of department. Advanced courses in anatomy and morphology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6080. Special Topics in Behavior. (1-4) Prerequisite: consent of department. Advanced courses in behavior. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6090. Special Topics in Ecology. (1-4) Prerequisite: consent of department. Advanced courses in ecology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6102. Cell and Molecular Biology. (4) Prerequisites: CHEM 6101, or consent of instructor. Structure of cellular components; the cell cycle; regulation of transcription, translation, and protein trafficking; cell membranes and transport; cell-cell communication, including signal transduction; extracellular matrix. Thirty two-hour lectures. *(Fall)*

BIOL 6103. Microbiology and Immunology. (4) Prerequisites: CHEM 6101 and BIOL 6102, or consent of instructor. Function and pathogenesis of prokaryotes, as well as related aspects of host response. Microbial physiology with an emphasis on aspects relevant to pathogenesis; bacterial genetics with an emphasis on operons and regulons as model of control of bacterial gene expression; pathogenic microbiology with an emphasis on invasion and intracellular survival; immunology with an emphasis on the role of the immune response in resistance to infection. Thirty two-hour lectures. *(Spring)*

BIOL 6104. Integrative Systems Physiology. (4) Prerequisites: CHEM 6101, BIOL 6102, BIOL 6103, or consent of instructor. The functioning of an intact mammalian organism with an emphasis on human physiology. Traditional survey of organ systems' functions, and problems of the response of cells within tissues to stress and their impact on organismal response. Thirty two-hour lectures. *(Spring)*

BIOL 6600. Seminar. (1-2) Topics of current emphasis in biology. May be repeated for credit. *(Fall, Spring)*

BIOL 6800. Tutorial. (1-4) Directed study in areas of specialization in biology and related fields. Maximum credit toward degree: four hours. Offered on a *Pass/No Credit* or *IP* basis only. *(Fall, Spring)*

BIOL 6900. Research and Thesis. (1-8) *Pass/No Credit* or *IP* grading only. *(Fall, Spring)*

BIOL 7999. Master's Degree Graduate Residence. (1)

BIOL 8000. Special Topics in Biology. (1-4) Prerequisite: consent of department. Courses in selected topics and advanced studies in biology. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 8010. Special Topics in Microbiology. (1-4) Prerequisite: consent of department. Advanced courses in microbiology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 8030. Special Topics in Genetics. (1-4) Prerequisite: consent of department. Advanced courses in genetics. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 8040. Special Topics in Molecular Biology. (1-4) Prerequisite: consent of department. Advanced courses in biochemistry and molecular biology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 8050. Special Topics in Physiology. (1-4) Prerequisite: consent of department. Advanced courses in physiology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 8102. Cell and Molecular Biology. (4) Prerequisites: CHEM 8101, or consent of instructor. Structure of cellular components; the cell cycle; regulation of transcription, translation, and protein trafficking; cell membranes and transport; cell-cell communication, including signal transduction; extracellular matrix. Thirty two-hour lectures. *(Fall)*

BIOL 8103. Microbiology and Immunology. (4) Prerequisites: CHEM 8101 and BIOL 8102, or consent of instructor. Function and pathogenesis of prokaryotes, as well as related aspects of host response. Microbial physiology with an emphasis on aspects relevant to pathogenesis; bacterial genetics with an emphasis on operons and regulons as model of control of bacterial gene expression; pathogenic microbiology with an emphasis on invasion and intracellular survival; immunology with an emphasis on the role of the immune response in resistance to infection. Thirty two-hour lectures. *(Spring)*

BIOL 8104. Integrative Systems Physiology. (4) Prerequisites: CHEM 8101, BIOL 8102, BIOL 8103, or consent of instructor. The functioning of an intact mammalian organism with an emphasis on human physiology. Traditional survey of organ systems' functions, and problems of the response of cells within tissues to stress and their impact on organismal response. Thirty two-hour lectures. *(Spring)*

BIOL 8200. Interdisciplinary Colloquium. (1) Prerequisites: Admission to the Interdisciplinary Ph.D. in Biology Program. Discussion and analysis of topics of current emphasis in biomedicine and biotechnology. May be repeated for credit. Offered on a *Pass/No Credit* basis only. *(Fall)*

BIOL 8201. Seminar. (1) Prerequisites: Admission to the Interdisciplinary Ph.D. in Biology Program. Formal student presentations of current literature topics. May be repeated for credit. Offered on a *Pass/No Credit* basis only. *(Spring)*

BIOL 8800. Laboratory Rotations. (2) Prerequisites: Admission to the Interdisciplinary Ph.D. in Biology Program. Directed study in an area of specialization. May be repeated for credit. Offered on a *Pass/No Credit* basis only. *(Fall, Spring, Summer)*

BIOL 8999. Doctoral Dissertation Research. (0-9) Prerequisites: Admission to the Interdisciplinary Ph.D. in Biology Program. Individual investigation that culminates in the preparation and presentation of a doctoral dissertation. May be repeated for credit. Offered on a *Pass/No Credit* or *IP* basis only. *(Fall, Spring, Summer)*

BIOL 9999. Doctoral Degree Graduate Residence. (1)

BUSINESS ADMINISTRATION

Degree or Credential
M.B.A.; M.B.A. Plus Certificate

Coordinator
Associate Dean for Graduate Studies and Research
316 Friday Building
(704) 547-2569
(704) 547-4014 (fax)
http://www.uncc.edu/mba

Graduate Faculty

Accounting
Sak Bhamornsiri, Associate Professor of Accounting
Alan I. Blankley, Associate Professor of Accounting

Hughlene A. Burton, Assistant Professor of Accounting
Jack M. Cathey, Associate Professor of Accounting
Michael Cornick, Associate Professor of Accounting
L. Howard Godfrey, Professor of Accounting
Richard G. Schroeder, Professor of Accounting

Economics
Louis "Ted" Amato, Professor of Economics
John E. Connaughton, Professor of Economics
W. Young Davis, Jr., Professor of Economics
Carol B. Dole, Assistant Professor of Economics
Gaines H. Liner, Associate Professor of Economics
Ronald A. Madsen, Professor of Economics
Rob Roy McGregor, Associate Professor of Economics
Ellen M. Miller-Sewell, Assistant Professor of Economics
Benjamin Russo, Associate Professor of Economics
Peter M. Schwarz, Professor of Economics
Hui-Kuan Tseng, Associate Professor of Economics
Irvin B. Tucker, III, Associate Professor of Economics
Richard A. Zuber, Professor of Economics

Finance and Business Law
Lloyd P. Blenman, Associate Professor of Finance
William F. Kennedy, Associate Professor of Finance
Reinhold P. Lamb, Associate Professor of Finance
Claude C. Lilly, James J. Harris Chair of Insurance
Bennie H. Nunnally Jr., Professor of Finance
Steven Ott, Associate Professor of Finance
D. Anthony Plath, Associate Professor of Finance
Calvin W. Sealey, The Torrence E. Hemby, Sr., Distinguished Professor in Banking

Information & Operations Management
Haldun Aytug, Associate Professor of Management Information Systems
Frank C. Barnes, Professor of Operations Management
W. Douglas Cooper, Professor of Operations Management
Jack T. Hogue, Associate Professor of Management Information Systems
Moutaz J. Khouja, Associate Professor of Operations Management
Ram L. Kumar, Associate Professor of Management Information Systems
John F. Repede, Associate Professor of Management Information Systems and Operations Management
Stephanie S. Robbins, Associate Professor of Management Information Systems
Cem Saydam, Chair and Professor of Management Information Systems and Operations Management
Michael A. Smith, Assistant Professor of Information and Operations Management
Anthony C. Stylianou, Associate Professor of Management Information Systems
Susan J. Winter, Assistant Professor of Information and Operations Management

Management
Ella E. Bell, Associate Professor of Management
Rosemary Booth, Associate Professor of Management
Gerald E. Calvasina, Associate Professor of Management
Claudio Carpano, Associate Professor of Management
Richard M. Conboy, Associate Dean and Associate Professor of Management
Kent E. Curran, Professor of Management
Michael D. Ensley, Assistant Professor of Management
Virginia T. Geurin, Professor of Management
Robert A. Giacalone, Surtman Distinguished Professor of Business Ethics
I. Edward Jernigan III, Associate Professor of Management
Gary F. Kohut, Professor of Management
Craig Pearce, Assistant Professor of Management

Marketing
Christie H. Amato, Professor of Marketing
Charles D. Bodkin, Associate Professor Marketing
Alan T. Shao, Associate Professor of Marketing
Thomas H. Stevenson, Charles E. Cullen Distinguished Professor of Marketing
Linda E. Swayne, Professor of Marketing

Program of Study

The primary objective of graduate study in business is to develop candidates for leadership positions in complex organizations. The MBA Program focuses on developing the expertise to lead, influence, and persuade others through effective written and spoken communications; the ability to approach complex problems both systematically and imaginatively; the confidence to make decisions in the face of imperfect information, competing objectives, and technological change; the insight to recognize the ethical dimensions of organizational and individual decisions; the sensitivity to recognize that organizational decisions involve teamwork and consensus-building across diverse groups of individuals; and the awareness that business represents an inherently multinational enterprise that exists without geographical or cultural boundaries.

MBA courses are scheduled to accommodate part-time students and full-time students who may enroll in up to three courses each fall and spring semester. Classes are held in the evening throughout the year on campus and at UNC Charlotte Uptown. A part-time student can complete the program in three years. Full-time students can complete the program in two years, depending upon scheduling of courses.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Business Administration.

1) A generally satisfactory undergraduate record from an accredited college or university.
2) A satisfactory score on the Graduate Management Admission Test (GMAT) administered by the Educational Testing Service of Princeton, New Jersey.
3) A description of any significant work experience.

Degree Requirements

The MBA degree program comprises 42 graduate hours including a Functional Component, Applications Component, and 15 hours of electives, nine hours of which may be a concentration. The 15 hours may, but are not required to, include a concentration. Up to 12 hours of course work may be waived based on a recommendation of the relevant academic department and approval of the MBA coordinator. Necessary preparatory work will be determined during the admissions process, and courses to meet the specific need will be available in the Preparatory Component. All students in the program must meet the Graduate School's Requirements for a Master's Degree.

Preparatory Component

Prerequisites - These classes may be taken as a post-baccalaureate student or after admission to the MBA program. Courses in the MBA Preparatory Component must be completed before enrolling in 6000-level courses except by permission of the MBA program coordinator. Undergraduates in the Belk College of Business cannot take them for credit toward the bachelor's degree.

ACCT 3200 Foundations in Accounting (3)
BLAW 3200 Legal Environment in Business (3)
ECON 3200 Foundations in Economics (3)
INFO 3200 Foundations in Business Computing (3)
OPER 3200 Quantitative Analysis in Business (3)
(all students must take this or pass a proficiency exam offered prior to the Fall and Spring terms.)

I. Functional Component. (24 hours)

A. Primary Block (12 hours)
*Prerequisites: All requirements for admission to the program and Preparatory Component, except as approved by the MBA coordinator.

MBAD 6112 The Economics of Business Decisions (3)
MBAD 6121 Business Information Systems (3)
MBAD 6131 Managerial Accounting (3)
MBAD 6141 Operations Management (3)

B. Intermediate Block (9 hours)
*Prerequisites: All requirements for admission to the program. Completion of the Primary Block is strongly recommended. MBAD 6131 is a prerequisite for MBAD 6152.

MBAD 6152 Financial Management (3)
MBAD 6161 Organizational Leadership & Behavior I (3)
MBAD 6171 Marketing Management (3)

C. Advanced Block (3 hours)
*Prerequisites: All functional courses, listed above, in Primary Block and Intermediate Block should be completed before MBAD 6194 is taken.

MBAD 6194 Management Policy (3)

II. Applications Component (3 hours)
Prerequisites: All courses in the Functional Component

MBAD 6198 Professional Applications (3)

III. Concentration and Free Elective Component (15 hours)
Students complete 9 hours of elective courses specified for a concentration, and 6 hours in free elective courses. Students who do not choose to complete a concentration will substitute 9 hours in MBA electives for the 9 hours in concentration electives. Students may enroll in electives as soon as they complete the prerequisites for each course.

A. Concentration Block (9 hours)
*Prerequisite: Specific course(s) in Functional Component required by each concentration elective.

Business Finance
Requirement: **MBAD 6157, Theory of Corporate Finance, and** two of the following courses:

MBAD 5159 Student Managed Investment Fund II (3)
MBAD 6151 Financial Institutions and Markets (3)
MBAD 6153 Investment Management (3)
MBAD 6154 Current Topics in Finance (3)
MBAD 6155 Multinational Finance (3)
MBAD 6890 Directed Individual Study (3)

Economics
Requirement: **MBAD 6111, Macroeconomics and Business Forecasting,** and, upon approval of the Department of Economics Master's Planning Committee, two of the courses listed below. (The committee's approval is required to ensure that students have the mathematical prerequisites necessary for successful completion of the concentration. A student who is denied approval once may petition for approval a second time after receiving a grade of A or B in ECON 4100.)

ECON 6112 Graduate Econometrics (3)
ECON 6201 Advanced Macroeconomic Theory (3)
ECON 6202 Advanced Microeconomic Theory (3)
ECON 6218 Advanced Business Forecasting (3)

Financial Institutions/Commercial Banking
Requirement: **MBAD 6156, Commercial Bank Management,** and two of the following courses:

MBAD 6058 Special Topics in Financial Services (3)
MBAD 6151 Financial Institutions and Markets (3)
MBAD 6153 Investment Management (3)
MBAD 6154 Current Topics in Finance (3)
MBAD 6155 Multinational Finance (3)
MBAD 6890 Directed Individual Study (3)

Information and Technology Management
Requirement: three of the following courses.

MBAD 6028 Topics in Information Systems (3)
MBAD 6122 Technology-Enhanced Decision Making (3)

MBAD 6124 Business Information Systems Development (3)
MBAD 6125 Business Data Communications (3)
MBAD 6890 Directed Individual Study (3)

Management
Requirement: Three of the following courses:
MBAD 6162 Organizational Leadership and Behavior II (3)
MBAD 6163 Human Resource Management (3)
MBAD 6164 Executive Communication (3)
MBAD 6191 Entrepreneurship (3)
MBAD 6192 Business and Society (3)
MBAD 6193 International Business Concepts (3)
MBAD 6195 Strategic Mgmt. of Technology (3)
MBAD 6196 Strategic Planning (3)
MBAD 6197 International Business Strategy (3)
MBAD 6890 Directed Individual Study (3)

Student Structured Concentration
Students may propose a 9 semester hour, three-course concentration in a significant area of interest for approval by the MBA Program coordinator. This concentration may include graduate courses from other programs within the University.

B. Free Electives Block (6 hours)
*Prerequisites: Specific courses in the Functional Component required by each free elective.

Students are strongly encouraged to select courses outside their area of concentration and to include a course with an international/global perspective as one of their free elective courses.

* *Exceptions to prerequisites may be granted in special circumstances. Requests should be addressed in writing to the MBA Coordinator.*

Minor in Operations Research
The Master of Business Administration program also participates in the program leading to an interdisciplinary graduate minor in Operations Research. See the listing for *Operations Research* for complete information and program requirements.

Admission to Candidacy
An Admission to Candidacy form listing graduate-level courses that apply to the degree must be submitted to the MBA Office four weeks prior to the semester in which the student plans to complete the course work for the degree.

Application for Degree
An Application for Degree form must be completed and submitted with the graduation fee to the Registrar's Office by the published deadline.

Assistantships
A number of assistantships are available each year. In order to be competitive, applications should be submitted by March 15. Additional information is available in the MBA office.

MBA PLUS
Graduate Certificate

The MBA PLUS Graduate Certificate Program provides an opportunity for graduates of MBA Programs to broaden and update their business education. As business conditions, tools, and techniques change rapidly, a major way of staying at the forefront of knowledge is through additional university education. The MBA PLUS Certificate makes courses in the Belk College's MBA Concentrations available to persons who already have MBA degrees.

Admission Requirements
Applicants must satisfy the general requirements established by the Graduate School for admission to a graduate certificate program. Applicants must provide two official transcripts indicating the awarding of an MBA degree along with the Graduate application and application fee. (Graduates from the MBA program at UNC Charlotte are not required to send an official transcript.) Applicants will not be required to retake the GMAT.

Completion Requirements
The MBA PLUS Certificate requires completion of twelve or more semester hours of 6000-level courses. At least nine hours included in the student's program must be elective courses specified for the MBA Concentrations offered by the College. One 3-hour course may be a repeat of a course previously taken. This may be desirable if there has been a substantial content change in the area of interest since the student completed the MBA degree. A student may repeat more courses, but only one such repeated course will be counted toward the certificate. The nine hour elective requirement of the MBA PLUS corresponds to the nine hour concentrations in the MBA Program.

It is expected that most students will use their twelve hours or more to gain a concentration in a particular functional area of interest. However, a broader program that draws from a number of areas will be allowed.

Transfer credits are not accepted in the MBA PLUS Certificate Program. To receive the certificate, students must complete all courses with a grade of "B" or better within four years from the time of enrollment in the first certificate course.

An Application for Graduate Certificate (candidacy form) and an Application for Degree should be completed prior to the last semester of MBA PLUS course work.

Courses in Business Administration

Undergraduate Preparation Courses for the MBA

ACCT 3200. Foundations of Accounting. (3) Accelerated and in-depth study of conceptual foundations and applications of financial, cost and managerial accounting with emphasis on building accounting information bases for internal, managerial decision-making. (Accounting preparation to enter MBA. May not be taken for credit toward any undergraduate degree within the Belk College of Business Administration or used as equivalent credit for ACCT 2121-2122).*(Fall, Spring)(Evenings)*

BLAW 3200. Legal Environment in Business. (3) Legal environment in which business operates today; Legal, social, and ethical considerations of managers within the framework of federal and state regulatory laws; role and function of federal regulatory agencies and their impact on business activities. (Formerly MBAD 6181. *(Fall, Spring)*

ECON 3200. Foundations in Economics. (3) Overview of microeconomic and macroeconomic concepts. Microeconomics: scarcity, opportunity costs, marginal analysis, demand, supply and market structures. Macroeconomics: present values, national income accounting, interest rates, real values versus nominal values, monetary and fiscal policy, balance of payments, and economic growth. (Economics preparation to enter MBA program. Cannot be taken for credit toward any undergraduate degree within the Belk College of Business Administration or used as equivalent credit for ECON 1201 - 1202. Credit will not be given for ECON 3200 where credit has been given for ECON 1201 or ECON 1202.) *(Fall, Spring)*

INFO 3200. Foundations in Business Computing. (3) Introduction to computer systems in business with emphasis on the capabilities of computer systems (hardware & software) and skills needed to effectively use computerized decision tools for typical business problems. (Cannot be taken for credit toward any undergraduate degree within the Belk college of Business Administration.) (Formerly INFO 3131.)*(Fall, Spring)*

OPER 3200. Quantitative Analysis in Business. (3) Quantitative business research methods, information sources, and introduction to management decision making. Either OPER 3200 or a satisfactory performance on a proficiency examination on its content must be fulfilled by all MBA students as part of the preparatory component. (Cannot be taken for credit toward any undergraduate degree within the Belk College of Business Administration.) (Formerly MBAD 6100.) *(Fall, Spring)*

Graduate Only

MBAD 5158.Student Managed Investment Fund I. (3) Prerequisites: FINN 3120 or MBAD 6152, and FINN 3222 or FINN/MBAD 6153. Management of an actual portfolio consisting of a portion of the University's Endowment Fund. Admission is by permission of instructor. Students selected for the course are required to take MBAD 5159. (Same as FINN 5158.)*(Fall)*

MBAD 5159. Student Managed Investment Fund II. (3) Prerequisites: FINN 3120 or MBAD 6152, and FINN 3222 or FINN/MBAD 6153. Management of an actual portfolio consisting of a portion of the University's Endowment Fund. Admission is by permission of instructor. Student cannot enroll in this course without successfully completing MBAD 5158. (Same as FINN 5159.) *(Spring)*

MBAD 6028. Topics in Business Information Systems. (3) Prerequisite: MBAD 6121. Selected topics in information systems. Potential topics include information resource management, database management systems, management support systems, information systems in the financial and banking industry, information systems in manufacturing, information systems in health care, and EDP auditing. May be repeated for additional credit as the topics vary and with permission of MBA program coordinator. *(Yearly)*

MBAD 6058. Special Topics in Financial Services. (3) Prerequisite: MBAD 6152. Each year, the subject matter of this course deals with a different specialized and contemporary topic of interest to students who are preparing for management careers in the financial services industry. The topics are chosen and covered in a way that builds on and supplements the topics covered in other courses in the Financial Institutions/Commercial Banking concentration. Emphasis is placed on the managerial implications of the subject matter as well as the impact on the financial system. Topics covered in this course may vary from semester to semester, and the course may be repeated a maximum of one time for academic credit.*(On demand)*

MBAD 6111. Macroeconomics and Business Forecasting. (3) Prerequisite: ECON 3200 and OPER 3200 or equivalents. Advanced studies of the interrelations of markets in national and international economies; mechanisms of monetary policy and interest rate effects, foreign exchange rates and inflation; relations between national saving, fiscal policy, the foreign debts and capital investment; short-run and long-run effects of economic policy; tax policy, government spending and economic growth; types of economic forecasts; value and limits of forecasts. *(On Demand)*

MBAD 6112. The Economics of Business Decisions. (3) Prerequisites: ECON 3200 and OPER 3200 or equivalents. Economic concepts in the decision-making process. Topics include scarcity; marginal analysis and tools of optimization; demand and supply analysis and market structure; economic efficiency; regression analysis; risk analysis and game theory and international economic issues. *(Fall, Spring)*

MBAD 6121. Business Information Systems. (3) Prerequisite: INFO 3200 or equivalent. Examination of how information systems are developed and used in organizations, how information resources are managed, and the potential strategic and competitive impact information systems have in domestic and global business environments. *(Fall, Spring)*

MBAD 6122. Technology-Enhanced Decision Making. (3) Prerequisite: OPER 3200 or equivalent. An analytical approach to the management process. Generalized models for decision making with major emphasis on application of the scientific method to management problems. *(Yearly)*

MBAD 6123. Applied Management Science. (3) Prerequisite: MBAD 6122. Mathematical model building aimed at integrating methods and applications. Overview of mathematical programming in practice and a series of projects implementing models in business and the public sector. *(On demand)*

MBAD 6124. Business Information Systems Development. (3) Prerequisite: MBAD 6121. Examination of managerial issues associated with the study of business processes and the development of supporting information systems. Emphasis on the application of appropriate methodologies, techniques, and tools to analyze, design, and implement business information systems. Study of relevant IS project management and quality assurance techniques. *(Yearly)*

MBAD 6125. Business Data Communications. (3) Prerequisites: MBAD 6121. Examination of the information communication requirements of business environments, the fundamentals of communication technology, and the application of the technology for solving business problems. Emphasis on understanding communication technologies to assess needs, plan for the introduction of hardware and software, and manage these communication systems. *(On Demand)*

MBAD 6131. Managerial Accounting. (3) Prerequisite: ACCT 3200 or equivalent. Management's use of accounting. Topics include profit planning and control, evaluation of performance, cost analysis, and income tax planning. *(Fall, Spring)*

MBAD 6141. Operations Management. (3) Prerequisite: INFO 3200 and OPER 3200 or equivalents. Design, operation, and control of service and manufacturing systems. Emphasis on using analytical tools for problem solving in process analysis and re-engineering, work-force management, material and inventory management, aggregate planning, total quality management, and others. *(Fall, Spring)*

MBAD 6142. Quality and Manufacturing Management. (3) Prerequisite: MBAD 6141. Current issues and advances in operations management including just-in-time inventory management, total quality management, continuous improvement, flexible manufacturing systems, computer integrated manufacturing systems, technology evaluation and selection and operations strategy. *(On demand)*

MBAD 6151. Financial Institutions and Markets. (3) Prerequisite: MBAD 6152. Major financial institutions, particularly commercial banks, and their role in the intermediation process and as suppliers of funds to the money and capital markets. Comparative financial policies of these institutions are examined in the context of their legal and market environment. (Same as FINN 6151) *(Yearly)*

MBAD 6152. Financial Management. (3) Prerequisite: MBAD 6131. Theory and practice of corporate finance including asset management, cost of capital and capital budgeting, optimization problems and socio-economic aspects of financial management. Computer technology may be employed when applicable. (Same as FINN 6152) *(Fall, Spring)*

MBAD 6153. Investment Management. (3) Prerequisite: MBAD 6152. Theory and practice of investment decisions of individuals and fund managers. Topics include the status of capital market theory, the efficient market hypothesis literature, and a portfolio performance measurement. Standard institutional and investment analysis topics, futures and options markets, and international investment topics are covered. (Same as FINN 6153) *(Yearly)*

MBAD 6154. Current Topics in Financial Management. (3) Prerequisite: MBAD 6152. Examination of business finance topics currently being discussed in the business media and development of advanced analytical skills in those topic areas. Topics will change depending upon the business environment. The following topics form the basis of the course: lease vs. buy (borrow); leveraged buy-outs; merger analysis; international operations of American firms (capital budgeting); and capital structure decisions. (Same as FINN 6154) *(On Demand)*

MBAD 6155. Multinational Financial Management. (3) Prerequisites: MBAD 6152. Financial management of the multinational firm including management of foreign exchange risk and political risk, and the control and evaluation of financial policies of multinational firms. (Same as FINN 6155) *(Yearly)*

MBAD 6156. Commercial Bank Management. (3) Prerequisite: MBAD 6152. Techniques for the management of commercial banks. Topics of study include industry structure, administrative organization, management of assets, liabilities, and capital, and financial analysis of the banking firm. (Same as FINN 6156) *(Yearly)*

MBAD 6157. Theory of Corporate Finance. (3) Prerequisite: MBAD 6152. Theories of modern corporate finance, including theory of efficient capital markets; uncertainty and the theory of choice; market equilibrium asset pricing models (capital asset pricing model, arbitrage pricing theory, Black-Scholes); theories of capital structure and the cost of capital; dividend policy; and leasing. (Same as FINN 6157) *(Yearly)*

MBAD 6161. Organizational Leadership and Behavior I. (3) Behavioral knowledge and skills essential to becoming an effective manager/leader including behavior and motivation in an environment of complexity and rapid change and ethical implications of actions and their effects on demographically diverse and increasingly international work force. *(Fall, Spring)*

MBAD 6162. Organizational Leadership and Behavior II. (3) Prerequisite: MBAD 6161. Continuation of MBAD 6161 Examines performance determinants and appraisal, design of complex organizations, team building, organizational change, career development and conflict management. *(Yearly)*

MBAD 6163. Human Resource Management. (3) Prerequisite: MBAD 6161. An examination of the current critical issues and strategic questions associated with managing employees. Case material, readings and audiovisual material will be used to stimulate discussion of the most important and strategic questions to be tackled by general managers today and in the future in the relationship between management and workers. *(Yearly)*

MBAD 6164. Executive Communication (3) Intensive study of communication in organizations from middle and upper management perspectives with special attention to corporate communication, media relations, technologically mediated communication, crisis communication and public affairs. Case studies, readings and project assignments will be used in a variety of business situations. *(Yearly)*

MBAD 6171. Marketing Management. (3) A managerial approach to strategic marketing decision-making. Topics include promotional strategy, channels of distribution, demand analysis and pricing, and international marketing. Case studies, readings and simulations are used. *(Fall, Spring)*

MBAD 6172. Marketing Research. (3) Prerequisite: MBAD 6171. Planning, execution and evaluation of marketing research activities. Emphasis on the techniques and methodology used in the collection, analysis and interpretation of economic, demographic and sociological data for use in marketing decision making. *(Yearly)*

MBAD 6173. Promotional Strategy. (3) Prerequisite: MBAD 6171. Opportunities and challenges for an organization through advertising, personal selling, sales promotion and publicity. It includes analysis of the legal and ethical problems involved in this area. Case studies and a project assignment are used. *(Yearly)*

MBAD 6174. International Marketing. (3) Prerequisite: MBAD 6171 or consent of instructor. Study of opportunities, problems and techniques involved in marketing internationally. Analysis of environmental forces which affect international marketing and the methods companies utilize to market effectively on an international scale. *(Yearly)*

MBAD 6175. Logistics Management. (3) Prerequisite: MBAD 6171 or permission of the instructor. Study of the logistics system as a source of profitability and competitive advantage. Component activities (customer service, inventory, storage, transportation) are examined individually and as parts of a larger whole, with emphasis on effective management of the overall system of finished goods distribution. Special attention is given to managing the transportation function in a deregulated environment. *(Yearly)*

MBAD 6191. Entrepreneurship. (3) Prerequisites: MBAD 6131, 6152, 6171, or permission of the MBA Coordinator. An examination of entrepreneurship and entrepreneurs. Focus on planning the start-up of a fast-growth enterprise with the aim of rewarding the founders and initial investors with significant capital gains. Extensive use of case studies will provide a background of classroom activities to assist students in the preparation of a detailed plan for the hypothetical start-up of a fast-growth firm. *(Yearly)*

MBAD 6192. Business and Society. (3) Ethical, moral, political and social aspects of policy formulation and implementation. Management's responsibilities to consumers, employees, investor/owners, and society are stressed. Case studies are used. *(Yearly)*

MBAD 6193. International Business Concepts. (3) Prerequisites: MBAD 6152, 6171, or permission of the MBA Program Coordinator. An overview of international business management. Specifically, the functional areas of business are covered to provide an international perspective. *(Yearly)*

MBAD 6194. Management Policy. (3) Prerequisite: All courses in the primary and intermediate block of the Functional Component or permission of the MBA Coordinator. Examination of the need to integrate the functional activities of the firm in planning corporate objectives and achieving operating results. Emphasis on

ability to identify issues and problems of the firm as a whole, to explore alternatives and to make decisions which recognize the interrelationships of the functional specialties within the total organization. Application and integration of knowledge and skills of analysis developed in the preceding courses of the MBA program.*(Fall, Spring)*

MBAD 6195. Strategic Management of Technology. (3) Prerequisites: MBAD 6141, 6152, and 6171. Impact of changing technology upon industries and companies and the consequent challenges for business managers. Major topics include: the historical context of change and innovation; organization and innovation; technology and business strategy; impact on functional areas; managing linkages; venturing and organization learning; government influence on innovation; executive leadership; the management of innovation and change. A comprehensive written report covering a significant aspect of emerging technology is required. *(On demand)*

MBAD 6196. Strategic Planning. (3) Prerequisite: MBAD 6194. Strategic planning within a rapidly changing environment including changing industry conditions as well as technological, social, political and economic changes. Examination of strategic planning techniques being developed by researchers and by corporate practitioners. *(On demand)*

MBAD 6197. International Business Strategy. (3) Prerequisites: MBAD 6152 and 6171. Management challenges associated with the development of international strategies and the management of organizations in business enterprises whose operations stretch across national boundaries; how multinational enterprises (MNEs) work. Case studies, projects, and presentations are used to help students apply concepts and theories. *(On demand)*

MBAD 6198. Professional Applications. (3) Prerequisites: Completion of the Functional Component. Team-taught, multidisciplinary course based on (1) structured, written cases and (2) contemporary management problems/issues presented in a non-structured, non-case format. Requires formal written position papers evaluating current business problems which are presented and defended before an audience of peers, faculty members, and business leaders.*(Fall, Spring)*

MBAD 6500. Cooperative Education Experience. (0) Prerequisite: Completion of nine hours of graduate coursework. Participation in the Co-op Program enables MBA students to pursue practical work experience that is complementary to their major course of studies. Each student's program must be approved by the coordinator of the MBA program. *(Fall, Spring)*

MBAD 6890. Directed Individual Study. (3) Directed individual study and in-depth analysis of a special area of management, economics, business or accounting. The course may be used to satisfy up to six semester hours of graduate credit requirements in the Master of Business Administration degree program and may be repeated for credit provided a different area of study is undertaken each time. Permission of a member of the graduate faculty who would direct the study and permission of the MBA program coordinator must be secured before registering for the course. *(Fall, Spring)*

MBAD 7999. Master's Degree Graduate Residence. (1) See Department for more information.

CHEMISTRY

Department of Chemistry

Burson Building, Room 200
(704) 547-4765
http://www.chem.uncc.edu/grad/

Degree

M.S.

Coordinator

Dr. Jordan C. Poler

Graduate Faculty

Banita W. Brown, Associate Professor
Brian T. Cooper, Assistant Professor
Bernadette T. Donovan-Merkert, Associate Professor
Thomas D. DuBois, Professor
Arthur Greenberg, Professor and Chair
James W. Hovick, Assistant Professor
Daniel S. Jones, Associate Professor
Joanna K. Krueger, Assistant Professor
Craig A. Ogle, Professor
Jordan C. Poler, Assistant Professor
Daniel Rabinovich, Assistant Professor
John M. Risley, Associate Professor
Wade N. Sisk, Assistant Professor
Eugene P. Wagner, III, Assistant Professor

Program of Study

The Chemistry Department offers a research-based Master of Science (M.S.) degree, which provides the background necessary for a career in industry or for further graduate studies in chemistry and related fields. The M.S. degree requires a minimum of 30 credit hours and a thesis based on original research carried out under the direction of a member of the graduate faculty. Student participation in research activities is through selection of a faculty adviser and enrollment in the special research courses offered in the summer sessions and during the academic year. Major emphasis is placed upon the research project and required thesis. UNC Charlotte B.S. degree chemistry majors may elect to participate in the

five year BS-MS program (described in the undergraduate catalog).

Additional Admission Requirements

In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Chemistry:

1) A satisfactory score on the Aptitude Portion of the Graduate Record Examination.
2) Conditional admission of students judged by the Chemistry department to be deficient in their training.
3) Administration of placement examinations by the department each semester just prior to registration as an aid in identifying such deficiencies.
4) Removal of any deficiencies within one year by remedial study directed by the department.
5) A score of 45 or better is required on the Test of Spoken English.

Degree Requirements

The candidate for the degree must present a minimum of 30 semester hours including at least 15 semester hours in 6000-level courses open to graduate students only. Required courses may include CHEM 5111, 5121, 5133, either 5134 or 5135. Two semester hours of graduate seminar, CHEM 6682, and at least one, but up to 16 semester hours of research and thesis credit, CHEM 6900, must be taken. In addition, six semester hours from the course group CHEM 6060, 6069, 6082, 6101, 6115, 6125, 6126, 6135, 6138, 6145, 6146, or 6165 are required. Departmental approval is necessary before CHEM 6060 credit can be used to satisfy this requirement. Any 5000 level or higher Biology, Engineering, Mathematics or Physics course, except those designed for a professional education sequence, may be taken for graduate credit upon departmental approval. Well-prepared students, particularly those with degrees from ACS-approved programs, will normally satisfy the requirement for CHEM 4111, 4121, 4133, and 4134, or 4135 through placement examinations administered after admission. In those cases, hours that would have been earned for these courses may be replaced by research, CHEM 6900, or by elective courses. A grade point average of 3.0 is required for the degree.

A student in the chemistry M.S. program is required to maintain satisfactory progress toward the degree. Continued enrollment is at all times subject to review on the basis of academic record. This review is performed by the departmental Graduate Committee.

Admission to Candidacy

An Admission to Candidacy form must be submitted approximately one month prior to the beginning of the semester in which the graduate student expects to complete all requisites for the M.S. degree.

Assistantships

Graduate students generally support their education through teaching or research assistantships available through the Chemistry Department. Further information is available in the Department.

Electives

Any 5000 level or higher Biology, Engineering, Mathematics or Physics course, except those designed for a professional education sequence, may be taken for graduate credit upon departmental approval.

Advising

Approval of the program of each student and monitoring his/her progress toward the degree is the responsibility of the student's research adviser. Prior to the selection of a research adviser, graduate student progress is monitored by the departmental Graduate Committee.

Thesis

A thesis must be written and defended within six calendar years after admission into the M.S. program as a degree student.

Thesis Committee

The written thesis is defended before a special thesis committee of no fewer than four persons, with at least one member from outside of the Chemistry Department.

Application for Degree

The Application for Degree can be submitted on the form supplied by the Graduate School no later than the filing date specified in the University calendar.

Research Experiences

The Chemistry Department offers research opportunities in such areas as laser spectroscopy, computational chemistry, microelectronics, microcomputer controlled instrumentation, biological chemistry, environmental chemistry and toxicology, chemical reactivity, organometallic chemistry, the structure and design of molecules, atmospheric chemistry, chemical dynamics, electrochemistry and chemical separation technology. Students receive academic credit for their research and may obtain financial assistance in the form of a stipend to support their research in the summer. The low student-to-faculty ratio in the Chemistry Department permits close faculty-student interaction throughout the student's research experience. Research in the Department is funded in part from competitive grants obtained from agencies such as the American Chemical Society, National Science Foundation, National Institutes of Health, Research Corporation, Dreyfus Foundation, North Carolina Biotechnology Center, UNC Charlotte Foundation, and private industry.

Tuition Waivers

Thomas Walsh Tuition Fellowships are available for students enrolled in the Master's degree program in

Chemistry and for students seeking an interdisciplinary Doctoral degree through the Chemistry Department. Further information is available in the Department.

COURSES IN CHEMISTRY

CHEM 5090. Special Topics in Chemistry. (1-4) Prerequisite: consent of the instructor. Selected topics in chemistry. Lecture and/or laboratory hours will vary with the nature of the course taught. May be repeated for credit. *(On demand)*

CHEM 5095. Topics for Teachers. (1-4) Prerequisite: consent of the instructor. Selected topics in chemical education. Lecture and/or laboratory hours will vary with the nature of the course taught. May be repeated for credit. *(On demand)*

CHEM 5111. Instrumental Analysis. (4) Prerequisites: satisfactory score on a chemistry proficiency exam, or consent of the instructor. Selected modern instrumental methods of analysis, including theory and practice, with considerable attention given to the instrument and elementary electronics involved in the techniques. Two lecture hours and six hours of lab per week. *(Spring)*

CHEM 5121. Advanced Inorganic Chemistry. (4) Prerequisites: satisfactory score on a chemistry proficiency exam, or consent of the instructor. Theoretical inorganic chemistry including the application of physicochemical principles to the study of inorganic systems. Laboratory work involves inorganic preparations and characterization techniques. Three lecture hours and one laboratory period of three hours a week. *(Fall)*

CHEM 5133. Methods of Organic Structure Determination. (2) Prerequisites: satisfactory score on a chemistry proficiency exam, or consent of the instructor. Study and application of modern techniques, primarily spectroscopy, to determine the structure of organic molecules. One hour of lecture and one laboratory period of three hours each week. *(Spring)*

CHEM 5134. Organic Reaction Mechanisms. (2) Prerequisites: satisfactory score on a chemistry proficiency exam, or consent of the instructor. Mechanistic and theoretical topics which are beyond the scope of CHEM 2131/2132, including orbital symmetry control of organic reactions, the Hammett Equation and other linear free energy relationships, heterocyclic compounds, polycyclic aromatic compounds, organic photochemistry, carbines, nitrenes, arynes and other short lived, reactive intermediates. *(Spring) (Alternate years)*

CHEM 5135. Concepts and Techniques in Organic Synthesis. (2) Prerequisite or corequisite: CHEM 5133, satisfactory score on a chemistry proficiency exam, or consent of the instructor. Modern techniques of organic synthesis. Laboratory includes one or more multi-step syntheses of complex molecules. One hour of lecture and one laboratory period of three hours each week. *(Spring) (Alternate years)*

CHEM 5165. Principles of Biochemistry I. (3) Prerequisite: satisfactory score on an organic chemistry proficiency exam, or consent of the instructor. A study of the structures, properties, and functions of biological molecules, bioenergetics of biological reactions, and enzyme catalysis, with particular emphasis on the underlying chemical principles, including thermodynamics and kinetics. *(Fall)*

CHEM 5165L. Principles of Biochemistry I Laboratory. (1) Prerequisite or corequisite: CHEM 5165. Physical properties of biological molecules and an introduction to experimental techniques of biochemical research. Eleven four-hour lab periods. *(Fall)*

CHEM 5166. Principles of Biochemistry II. (3) Prerequisite: CHEM 5165 with a grade of B or better. A study of various metabolic pathways and information transfer including molecular aspects of cell biology and genetics, with particular emphasis on the underlying chemical reactions, including thermodynamics and kinetics. *(Spring)*

CHEM 5167. Structure and Mechanism in Protein Chemistry (3) Prerequisites: CHEM 5165, and either CHEM 5166 or BIOL 5171, or consent of the instructor. Examination of structures, properties, and functions of proteins, enzyme catalysis, and bioenergetics, emphasizing underlying mechanistic chemical and biochemical principles. *(Spring) (Alternate years)*

CHEM 5171. Biochemical Instrumentation. (4) Prerequisites: CHEM 5165 and 5165L with a grade of B or better or the consent of the department. Modern instrumental methods used in biorelated areas such as biochemistry, biotechnology and medical technology. Theory and practice. Potentiometry, spectrophotometry, chromatography, sedimentation, and electrophoresis. Two lecture hours and two three-hour laboratory periods per week. *(Spring)*

CHEM 5175. Physical Biochemistry. (3) Prerequisites: CHEM 5165, 5165L, and 5166, with a grade of B or better, satisfactory score on a physical chemistry proficiency exam, or consent of the instructor. Colloid systems, equilibria in biological fluids, mass and energy transport in fluids and in association with membranes, energy storage and dissipation with relation to specific chemical bonding, enzyme kinetics. *(On demand)*

CHEM 5185. Chemical Fate of Pollutants. (3) Prerequisites: satisfactory score on chemistry proficiency exam, or consent of the instructor. Chemical reactivity and fate of pollutants (in air, water, soil) in terms of their chemical structure and energetics, mechanisms, structure/energy relationships and their interaction with

reactive environmental species including light. *(Spring) (Alternate years)*

CHEM 5200. Computational Chemistry. (4) Prerequisite or corequisite: satisfactory score on a chemistry proficiency exam, or consent of instructor. Electronic and molecular mechanics-based computational methods, including properties, optimized equilibrium and transition state structures and potential energy surfaces of reactions. Three lecture hours and three hours of laboratory each week. Additional projects required of graduate students. *(Fall, Spring)*

CHEM 6060. Special Topics and Investigations. (1-3) Prerequisite: consent of the instructor. Directed study of topics of current chemical interest. May be repeated for credit. *(On demand)*

CHEM 6069. Topics in Biochemistry. (3) Prerequisites: CHEM 6165, or consent of instructor. Discussion of current topics in biochemistry emphasizing their biomedical/biotechnological aspects from bioinorganic chemistry, bioorganic chemistry, bioanalytical chemistry, biophysical chemistry, biocomputational chemistry, biomaterials. May be repeated for credit. Three lecture hours per week. *(Spring)*

CHEM 6082. Surfaces and Interfaces of Materials Chemistry. (3) Prerequisites: Three semesters of calculus based mathematics (i.e., MATH 1241, 1242, and 2241 and an upper level graduate course in thermodynamics (i.e., CHEM 3142, PHYS 3151 OR MEGR 3112) or departmental approval. Theoretical basis, conceptual understanding and experimental investigations of the properties of surfaces and interfaces of various classes of materials will be presented. The content of this course will build from a rigorous derivation of the physical chemistry of surfaces and interfaces to a discussion of topical materials classes and specific materials properties. Three lecture hours each week. *(Alternate years)*

CHEM 6101. Biochemical principles. (3) Prerequisites: Consent of instructor. Molecular biophysics of biological molecules. Bioenergetics of biological reactions and enzyme structure, mechanisms, and regulation. Metabolic pathways and the role of cellular organelles. Biochemical analysis methodology. Twenty-three two-hour lectures. *(Fall)*

CHEM 6115. Advanced Analytical Chemistry. (3) Prerequisite: CHEM 5111 with a grade of B or better, satisfactory score on a chemistry proficiency exam, or consent of the instructor. The application of modern analytical methods to chemical problems. Emphasis is upon the chemical information, particularly structural, obtainable from these techniques. *(On demand)*

CHEM 6125. Theoretical Inorganic Chemistry. (3) Prerequisite: CHEM 5121 with a grade of B or better, satisfactory score on a chemistry proficiency exam, or consent of the instructor. Group theoretical treatment of current theories of inorganic chemistry. Topics covered: Ligand field theory, molecular orbital theory for complex ions, electronic spectra of complex ions and the magnetic properties of complex ions. *(On demand)*

CHEM 6126. Organometallic Chemistry. (3) Prerequisites: satisfactory score on a chemistry proficiency exam, or consent of instructor. Previous or concurrent enrollment in CHEM 5133 recommended. Synthesis, structure, characterization, and reactivity of organometallic compounds; introduction to catalysis and bioorganometallic chemistry. Three lecture hours each week. *(On demand)*

CHEM 6135. Advanced Organic Chemistry. (3) Prerequisite: CHEM 5133 and either 5134 or 5135 with a grade of B or better, satisfactory score on a chemistry proficiency exam, or consent of the instructor. A qualitative discussion of modern mechanistic interpretation of the relations between structure and reactivity. Special emphasis is placed on the role of reactive intermediates such as carbonium ions, carbanions, carbines and radicals. *(On demand)*

CHEM 6138. Stereochemistry. (3) Prerequisite: Advanced course in Biochemistry or Organic Chemistry. Three-dimensional chemistry and its chemical, physical and biochemical consequences, emphasizing classification of isomers and stereoisomers and the consequences of molecular shape on chemical and biological properties. *(Spring) (Alternate years)*

CHEM 6145. Chemical Thermodynamics. (3) Prerequisite: satisfactory score on a chemistry proficiency exam, or consent of the instructor. The postulatory basis of classical thermodynamics. Problems in chemical thermodynamics. The use of statistical mechanics for calculating thermodynamic functions. *(On demand)*

CHEM 6146. Rates and Mechanisms. (3) Prerequisite: satisfactory score on a chemistry proficiency exam, or consent of the instructor. Consideration of chemical kinetics and mechanism schemes, particularly those of current interest. *(On demand)*

CHEM 6150. Seminar-Internship. (1-3) Prerequisite: consent of the instructor. Required for all teaching assistants. Supervised experience in the teaching of college chemistry. Graded Pass/No Credit. May be repeated for credit. *(Fall, Spring)*

CHEM 6165. Advanced Biochemistry. (3) Prerequisites: CHEM 6101, BIOL 6102, 6103, 6104, or consent of instructor. Advanced course on protein structure, enzyme and mechanistic biochemistry, metabolic biochemistry, biophysical chemistry. Three lecture hours per week. *(Spring)*

CHEM 6681. Research Seminar. (1) Prerequisite: consent of the instructor. Discussion of recent developments and special topics in chemistry. Graded Pass/No Credit. *(Fall, Spring)*

CHEM 6682. Research Seminar. (1) Prerequisite: consent of the instructor. Individual investigation and exposition of the results. May be repeated for credit.*(Fall, Spring)*

CHEM 6900. Research and Thesis. (1-16) Prerequisite: consent of the instructor overseeing thesis research. Laboratory research for the thesis.*(Fall, Spring, Summer)*

CHEM 7999. Graduate Residence. (0) Prerequisite: consent of the instructor overseeing thesis research. Required of all master's degree students who are working on a thesis but not enrolled in other graduate courses. *(Fall, Spring)*

CHEM 8069. Topics in Biochemistry. (3) Prerequisites: CHEM 6165, or consent of instructor. Discussion of current topics in biochemistry emphasizing their biomedical/biotechnological aspects from bioinorganic chemistry, bioorganic chemistry, bioanalytical chemistry, biophysical chemistry, biocomputational chemistry, biomaterials. May be repeated for credit. Three lecture hours per week.*(Spring)*

CHEM 8101. Biochemical Principles. (3) Prerequisites: Admission to Ph.D. program. Molecular biophysics of biological molecules. Bioenergetics of biological reactions and enzyme structure, mechanisms, and regulation. Metabolic pathways and the role of cellular organelles. Biochemical analysis methodology. Twenty-three two-hour lectures.*(Fall)*

CHEM 8165. Advanced Biochemistry. (3) Prerequisites: CHEM 8101, BIOL 8102, 8103, 8104. Advanced course on protein structure, enzyme and mechanistic biochemistry, metabolic biochemistry, biophysical chemistry. Three lecture hours per week. *(Spring)*

COMMUNICATION

Graduate Certificate

Department of Communication Studies

235 Fretwell Building
(704) 547-4005

Credential

Certificate

Coordinator

Dr. Richard Leeman

Graduate Faculty

Jonathan Crane, Associate Professor
Darlene Drummond, Assistant Professor
Alan Freitag, Assistant Professor
Bill Hill, Professor
John Huffman, Professor
Ruth Kinzey, Lecturer
Richard Leeman, Associate Professor
Denise Trauth, Professor

Program of Study

The Graduate Certificate in Communication is designed to provide advanced study in the field of communication. The program emphasizes the ability to understand and analyze communication practices in the 21st century. The curriculum is broad based, and includes opportunities to study the theory and practice of communication in the areas of organizational communication, public relations, mass media, and health communication.

Additional Admission Requirements

GRE, personal statement, three letters of recommendation.

Certificate Requirements

Fifteen credit hours in graduate communication courses, including Comm 6100, with no more than six credit hours at the 5000 level.

Core Course

Comm 6100 Communication Research Methods

Advising

Contact the Graduate Coordinator.

COURSES IN COMMUNICATION

COMM 5101. Media and the Law. (3) Prerequisite: At least junior standing or consent of instructor. Survey of legal rights, restrictions, and ethical considerations in field of communication including the First Amendment, libel, invasion of privacy, obscenity law, regulation of electronic media, relationships between media and judiciary.*(Fall, Spring)*

COMM 5102. Federal Interpretation of the First Amendment. (3) Prerequisite: At least junior standing or consent of instructor. In-depth case analysis of tests determining Constitutional boundaries of expression including clear and present danger, prior restraints, fighting words/symbolic speech, strict scrutiny, obscenity, indecency.(Cross listed with POLS 3102.)*(Fall, Spring)*

COMM 5141. Advanced Organizational Communication. (3) Prerequisite: COMM 3141. Critical examination of the communication practices of organizations which accomplish such tasks as establishing organizational identification influencing organizational

members, and making decisions. Includes application of research methods to assess and analyze an organization's communication practices. *(Spring)*

COMM 5145. Public Relations Lab. (3) Prerequisites: COMM 3145 and 3245. Lectures, workshops and guest speakers provide knowledge to enable students to research, design, implement, and complete public relations projects for community-based, not-for-profit organizations. The class is structured and run in a manner similar to a professional public relations agency with students assuming appropriate agency roles. May be repeated once. *(Fall, Spring)*

COMM 6000. Topics in Communication Studies. (3) Prerequisite: graduate standing. Intensive investigation of a timely and important topic in communication studies. The topic of investigation may vary from semester to semester. May be repeated for credit with permission of graduate advisor. *(On demand, Evenings)*

COMM 6100. Communication Research Methods. (3) Methods for systematic investigation of communication behavior. Theoretical and practical applications of both qualitative and quantitative research methodologies are utilized for completion of original projects. *(Fall, Evenings)*

COMM 6141. Organizational Communication Case Studies. (3) Communication theories are applied to real and fictional organizational cases. Topics such as culture, diversity, change, networks, and diffusion of innovations are examined from a communication perspective. *(Yearly, Evenings)*

COMM 6145. Communication Campaign Management. (3) A blending of theory and application to public relations/communication campaigns. The application dimension stresses mastery of the technical aspects of the campaign: research, problem-solving, planning, evaluation, and teamwork. The theoretical dimension stresses the study of actual campaigns and formulating generalizations regarding their successes or shortcomings. Class members serve on account teams with the instructor as manager. Account teams represent real-world clients and prepare a campaign book for the client's later implementation. *(Yearly, Evenings)*

COMM 6170. Communication Law and Policy (3) Survey of legal rights, legal restrictions, and policy developments governing public communication in the United States. *(Fall, Spring) (Evenings)*

COMPUTER SCIENCE

Department of Computer Science
201 Kennedy Building
(704) 547-4880
http://www.cs.uncc.edu

Degree
M.S.

Coordinator
Dr. Zbigniew W. Ras

Graduate Faculty
Professors
C. Michael Allen
Bei-Tseng Chu
Zbigniew Michalewicz
Zbigniew W. Ras
Gyorgy Revesz
Barry Wilkinson
Jan Zytkow

Associate Professors
Keh-Hsun Chen
Mirsad Hadzikadic
Junsheng Long
Taghi Mostafavi
Hassan M. Razavi
K.R. Subramanian
Jing Xiao

Assistant Professors
Essam El-Kwae
William J. Tolone

Adjuncts
Alicja Wieczorkowska

Program of Study
The objective of the computer science program leading to the Master of Science degree is to provide advanced skills and knowledge in the planning, design, implementation, testing, and management of computer systems. These skills are necessary for dealing with the problems encountered in business, industry, and governmental computer applications; for holding administrative or engineering positions requiring the planning and implementation of computer systems; for teaching computer science; and/or for further study in computer science, in particular, for doctoral study.

The primary areas of interest are: computer networks and communication, computational intelligence, decision support systems, enterprise integration, graphics, imaging and visualization, intelligent information systems, knowledge discovery and data mining, multimedia

databases, parallel processing, robotics, and software engineering.

Minor in Operations Research
The Department of Computer Science participates in the program leading to an interdisciplinary graduate minor in Operations Research. See Operations Research Section of this Catalog for complete information and program requirements.

Additional Admission Requirements
In addition to the general requirements for admission to the graduate school, the program requires a current working knowledge of two higher-level languages, including at least one procedural language; knowledge of assembly language, data structures, and computer organization; and a familiarity with computer applications. The following minimal background in mathematics is also required: two semesters of calculus and one semester each of: linear algebra and discrete structures. Individuals who have worked at a high professional level in the computer industry may be able to substitute work experience for specific subject area admission requirements.

Students must have an undergraduate grade point average of at least 2.8 (on a 4.0 point scale) and a junior/senior GPA of at least 3.0.

A satisfactory score on the aptitude portion of the Graduate Record Examination is required; the subject test in Computer Science is not required, but may be submitted for consideration.

Students with special backgrounds who do not meet all of the above requirements may be granted conditional admission.

Degree Requirements
Candidates for the Master of Science in Computer Science have the option of either:
1) completing 24 semester hours of course work, writing a thesis for six hours of credit, and passing a comprehensive examination; or
2) completing 30 semester hours of course work and passing a comprehensive examination.

Either option can be completed on a full or part-time basis.

All students are required to complete or have the equivalent of CSCI 5102, 5112, 6114, and 5141 for a total of 12 semester hours. Each student will select with his or her academic adviser 12 to 18 semester hours of additional course work to meet program requirements or career goals.

A maximum of six semester hours of graduate credit may be transferred from other institutions.

Assistantships
Financial assistance for qualified students is available on a competitive basis in the form of graduate teaching and research assistantships. The deadline for graduate teaching assistantship applications is March 31 for the following academic year.

Comprehensive Examination
Successful completion of a written comprehensive examination is required. The examination covers the following core areas: algorithms and data structures, computer organization and architecture, and programming languages. The examination is given twice a year in April and November. A student is allowed to repeat the examination only once. Failure on the comprehensive examination a second time results in the student's removal from the program.

Course descriptions follow the Advanced Databases and Knowledge Discovery program

ADVANCED DATABASES and KNOWLEDGE DISCOVERY
Graduate Certificate

Credential
Graduate Certificate

School of Information Technology
Kennedy Building
(704) 547- 4880
http://www.sit.uncc.edu/htm/certif.html

Coordinator
Dr. Zbigniew W. Ras

Graduate Faculty
Professors
Zbigniew Michalewicz
Zbigniew W. Ras
Jan Zytkow

Associate Professors
Haldun Aytug
Keh-Hsun Chen
Mirsad Hadzikadic
Ram L. Kumar
Antonis Stylianou

Assistant Professors
Essam El-Kwae

Adjuncts
Ilieva Ageenko
Bruce Anderson
Alicja Wieczorkowska

Program of Study

The purpose of this certificate is to provide graduate students with the opportunity to reach a demonstrated level of competence in the areas of databases and knowledge discovery. Course-work towards this graduate certificate can be used for credit towards the MS degree in Computer Science. However, its primary objective is to provide a well-defined target for students who want to advance their knowledge of modern databases and knowledge discovery techniques but do not necessarily wish to complete all requirements for the M.S. degree in Computer Science. The certificate may be pursued concurrently with any of the graduate degree programs at UNC Charlotte.

Additional Admission Requirements

This certificate program is open to all students who hold a BS degree in any scientific, engineering or business discipline and either:

1) are enrolled and in good standing in a graduate degree program at UNC Charlotte, or
2) have GPA above 2.8 overall and 3.0 Jr./Sr.

Applicants are required to submit a brief (one-to-two page) statement of educational and work experience in the computing field. Application for the ADKD certificate program is made through the Office of Graduate Admissions.

Completion Requirements

The certificate will be awarded upon completion of five graduate level courses (15 credits) in the area of knowledge discovery and databases. A cumulative GPA of 3.0 will be required and at most one course with a grade of C may be allowed towards the certificate.

To obtain the certificate a student needs to:

I. Take the following required courses:

CSCI 5150	Artificial Intelligence (3)
CSCI 6114	Algorithms and Data Structures (3) , *or*
CSCI 6160	Database Systems, Design and Management (3)
CSCI 6162	Knowledge Discovery in Databases (3)

II. Take two courses from:

CSCI 6155	Knowledge-Based Systems (3)
CSCI 6156	Machine Learning (3)
CSCI 6161	Advanced Topics in Database Systems (3)
CSCI 6163	Data Warehousing (3)
MBAD 6028	Topics in Business Information Systems (3)
MBAD 6124	Business Information Systems Development (3)

Courses in Computer Science

CSCI 5010. Topics in Computer Science. (3) Prerequisite: consent of the department. Topics in computer science selected to supplement the regular course offerings. May be repeated for credit as topics vary. *(On demand)*

CSCI 5050. Topics in Intelligent Systems. (3) Prerequisite: consent of the department. Topics in intelligent systems selected to supplement the regular course offerings. May be repeated for credit as topics vary. *(Spring, Alternate years) (Evenings)*

CSCI 5080. Topics in Computer Engineering. (3) Prerequisite: consent of the department. Topics in computer engineering selected to supplement the regular course offerings. May be repeated for credit as topics vary. *(On demand)*

CSCI 5102. Survey of Programming Languages. (3) Prerequisite: consent of the department. Study of the concepts underlying various computer languages and comparing and evaluating various language features. History and development of various languages, such as FORTRAN, ALGOL, PASCAL, MODULA-2, C, C++, Ada, Lisp, Smalltalk, Prolog.; evaluation and comparison of various algorithms and language suitability. Selection of languages for problems/environments. Overview of various languages. *(Fall, Spring, Evenings)*

CSCI 5107. Formal Languages and Automata. (3) Prerequisites: one semester of discrete structures or consent of the department. Detailed study of abstract models for the syntax of programming languages and information processing devices. Languages and their representation; grammars; finite automata and regular sets; context-free grammars and pushdown automata; Chomsky Hierarchy; closure properties of families of languages; syntax analysis. *(On demand)*

CSCI 5110. Programming Languages and Compilers. (3) Prerequisite: consent of the department. Introduction to the concepts and techniques used in describing, defining, and implementing programming languages and their compilers. Introduction to parsing and parser construction; LL and LR grammars; syntax directed translation; data object representations; run time structures; intermediate languages; code optimization. *(Fall, Alternate years) (Evenings)*

CSCI 5112. Software System Design and Implementation. (3) Prerequisite: consent of the department. Introduction to the techniques involved in the planning and implementation of large software systems. Emphasis on human interface aspects of systems. Planning software projects; software design process; top-down design; modular and structured design;

management of software projects; testing of software; software documentation; choosing a language for software system. *(Fall, Spring) (Evenings)*

CSCI 5130. Computer Graphics. (3) Prerequisites: CSCI 1215 or equivalent and MATH 2164 or equivalent. Introduction to the design and implementation of interactive graphics systems. Raster and vector display systems, I/O devices; graphics primitives and their attributes; raster algorithms and clipping; 2D/3D geometric transformations; 3D viewing and projections; hierarchical and procedural models; surface representation; color and lighting models; rendering algorithms; global illumination and texture mapping. *(Fall, Alternate years) (Evenings)*

CSCI 5131. Simulation. (3) Prerequisites: CSCI 1214 and MATH 3122, or consent of department. Emphasis on the design and derivation of mathematical models of dynamic systems; deterministic simulation; random events; non-deterministic simulation; discrete simulation; comparison and optimization. *(On demand)*

CSCI 5141. Computer Organization and Architecture. (3) Prerequisite: CSCI 3182 or equivalent. Fundamentals of computer design; instruction set design, basic processor implementation techniques; pipelining; memory hierarchy; input/output. Cost/performance and hardware/software trade-offs. *(Fall, Spring) (Evenings)*

CSCI 5145. Parallel Computing. (3) Prerequisites: CSCI 1215 and 3182 or consent of department. Types of parallel computers, programming techniques for multiprocessor and multicomputer systems, parallel strategies, algorithms, and languages. *(Spring, Alternate years) (Evenings)*

CSCI 5150. Artificial Intelligence. (3) Prerequisites: CSCI 2215 or consent of department. To introduce core ideas in AI. Heuristic versus algorithmic methods; problem solving; game playing and decision making; automatic theorem proving; pattern recognition; adaptive learning; projects to illustrate theoretical concepts. *(Fall, Alternate years) (Evenings)*

CSCI 5151. Intelligent Robotics. (3) Prerequisites: CSCI 1215 and MATH 2164, or consent of the department. General introduction to spatial descriptions and transformations, and manipulator position and motion. More study on robot planning, programming, sensing, vision, and CAD/CAM. *(On demand)*

CSCI 5152. Computer Vision. (3) Prerequisites: CSCI 1215 or MATH 2164, or consent of the department. General introduction to Computer Vision and its application. Topics include low level vision, 2D and 3D segmentation, 2D description, 2D recognition, 3D description and model-based recognition, and interpretation. *(On demand)*

CSCI 5157. Computer-Aided Instruction. (3) Prerequisite: consent of the department. History of CAI; study of current CAI systems; development of man-machine dialogue; programming tools for CAI; information structures for computer-oriented learning. Advantages/disadvantages/ costs of CAI. *(On demand)*

CSCI 5165. Coding and Information Theory. (3) Prerequisite: knowledge of probability theory. Information theory; coding theory; Shannon's theorem; Markov process; channel capacity; data transmission codes; error correcting codes; data compression; data encryption. *(On demand)*

CSCI 5171. Logic Programming. (3) Prerequisite: CSCI 2215 or consent of the department. Prolog programming language; programming techniques in Prolog; foundations of logic programming including computability of Horn clause logic, completeness of resolution principle, complexity of unification algorithms, and verification of logic programs; principles of implementing logic programming systems; selected topics from applications of logic programming to expert systems, intelligent database systems, and/or natural language processing. *(On demand)*

CSCI 5181. Microcomputer Interfacing. (3) Prerequisite: CSCI 3182 or ECGR 3181, or permission of the department. Signal conditioning, A/D conversion, noise, transmission line effects, signal processing, D/A conversion and serial/parallel interfaces. *(Fall, Alternate years)(Evenings)*

CSCI 5183. Computer Arithmetic. (3) Prerequisite: permission of the department. Principles, architecture, and design of fast two operand adders; multioperand adders, standard multipliers, and dividers. Cellular array multipliers and dividers. Floating point processes, BCD, and excess three adders, multipliers, and dividers. *(On demand)*

CSCI 6010. Topics in Computer Science. (3) See CSCI 5010 for Course Description. *(On demand)*

CSCI 6050. Topics in Intelligent Systems. (3) See CSCI 5050 for Course Description. *(Spring, Alternate years)(Evenings)*

CSCI 6080. Advanced Topics in Computer Engineering. (3) See CSCI 5080 for Course Description. *(On demand)*

CSCI 6110. Advanced Topics in Programming Languages and Compilers. (3) A continuation of material in CSCI 5110 with emphasis on advanced aspects of optimization, data flow analysis, and error discovery. *(On demand)*

CSCI 6111. Evolutionary Computation. (3) Prerequisite: CSCI 6114 or consent of the department. General introduction to optimization problems. Optimization techniques: hill climbing, simulated annealing, evolution strategies, genetic algorithms. Evolution programming techniques. *(Spring, Alternate years)(Evenings)*

CSCI 6114. Algorithms and Data Structures. (3) Prerequisite: full graduate standing. Introduction to techniques and structures used and useful in design of sophisticated software systems. Records; arrays; linked lists; queues; stacks; trees; graphs; storage management and garbage collection; recursive algorithms; searching and sorting; graph algorithms; time and space complexity. *(Fall, Spring) (Evenings)*

CSCI 6115. Advanced Topics in Algorithms and Data Structures. (3) Prerequisite: CSCI 6114. Continuation and extension of CSCI 6114. String matching; seminumerical algorithms; probabilistic algorithms; parallel algorithms; NP-completeness; computationally hard problems; approximation algorithms. *(On demand)*

CSCI 6130. Advanced Computer Graphics. (3) Prerequisites: CSCI 5130 or equivalent, full graduate standing or consent of department. Implicit and parametric representation; cubic surfaces; advanced reflection models; global illumination models - ray tracing, radiosity; shadow algorithms, texture mapping; volumetric modeling and rendering techniques; animation; advanced modeling techniques; particle systems, fractals. *(On demand)*

CSCI 6132. Computer Modeling and Simulation. (3) Prerequisites: CSCI 5131 and consent of department. Introduction to modeling of complex systems. Emphasis on modeling of computer systems and configurations. *(On demand)*

CSCI 6134. Digital Image Processing. (3) Prerequisite: CSCI 6114 or consent of the department. Cross-listed as ECGR 6118. Image perception; image types/applications; image restoration and enhancement; edge/boundary detection; image transformation; image segmentation; statistical and syntactical pattern recognition; image information measures and compression. *(On demand)*

CSCI 6140. Data Visualization. (3) Prerequisite: Full graduate standing or consent of department. Emphasis on the methodology and application of data visualization to scientific and engineering data; data types and models; visualization methods; volume visualization; scalar, vector and tensor fields; multi-variate visualization; visualization systems and model; visualization applications; visualization software and hardware; research issues and future trends. *(Fall, Alternate years) (Evenings)*

CSCI 6144. Operating Systems Design. (3) Prerequisite: CSCI 6114 or consent of department. Introduction to features of a large-scale operating system with emphasis on resource-sharing environments. Computer system organization; resource management; multiprogramming; multi-processing; file systems; virtual machine concepts; protection and efficiency. *(Fall, Alternate years) (Evenings)*

CSCI 6148. Advanced Object-Oriented Systems. (3) Prerequisites: CSCI 6114 and 5102, or equivalent courses. This course focuses on issues related to the design, implementation, integration, and management of large object-oriented systems. Topics include: object models, object modeling, frameworks, persistent and distributed objects, and object-oriented databases. *(Fall, Alternate Years)(Evenings)*

CSCI 6153. Neural Networks. (3) Prerequisites: CSCI 6114. Topics include: Basic notions and models of artificial neural nets; single layer neural classifiers; multilayer one-way neural nets; single layer feedback networks; neural models of associative memory; self organizing neural nets; translation between neural networks and knowledge bases; applications of neural networks. *(On demand)*

CSCI 6154. Heuristic Search. (3) Prerequisite: CSCI 5150. Heuristics and problem representation; heuristic-search procedures; formal properties and performance analysis of heuristic methods; game-searching strategies and heuristic programming; search with probabilities; knowledge-guided search. *(Spring, Alternate years) (Evenings)*

CSCI 6155. Knowledge-Based Systems. (3) Prerequisite: CSCI 5150. Knowledge representation; automatic deduction; techniques for handling uncertainty and inexact knowledge; principles of rule-based systems and frame-based systems. Selected study of actual knowledge-based systems and knowledge engineering tools. A course project of building a knowledge-based system. *(Fall, Alternate years) (Evenings)*

CSCI 6156. Machine Learning. (3) Prerequisite: CSCI 5150. Machine learning methods and techniques including: acquisition of declarative knowledge; organization of knowledge into new, more effective representations; development of new skills through instruction and practice; and discovery of new facts and theories through observation and experimentation. *(On demand)*

CSCI 6158. Natural Language Processing. (3) Prerequisite: CSCI 5150. Principles, methodologies, and programming methods of natural language processing including foundations of natural language understanding, namely: lexical, syntactic, and semantic analysis, discourse integration, and pragmatic and morphological analysis. *(On demand)*

CSCI 6160. Database Systems, Design and Management. (3) Prerequisite: CSCI 6114 or consent of the department. Introduction to principles of database design, and survey of alternative database organizations and structures. Logical database organization; schemas; subschemas; data description languages; hierarchical, network, and relational databases; database management systems; normal forms. *(Fall, Spring on demand)(Evenings)*

CSCI 6161. Advanced Topics in Database Systems, Design and Management. (3) Prerequisite: CSCI 6160. Continuation of CSCI 6160. Topics include addressing techniques; physical structures; searching; compaction techniques; storage hierarchies; multiple-key retrieval; efficiency and security considerations. *(Spring, Alternate years)(Evenings)*

CSCI 6162. Knowledge Discovery in Databases. (3) Prerequisite: CSCI 6160, full graduate standing, or consent of the department. The entire knowledge discovery process is covered in this course. Topics include: setting up a problem, data preprocessing and warehousing, data mining in search for knowledge, knowledge evaluation, visualization and application in decision making. A broad range of systems, such as OLAP, LERS, DatalogicR+, C4.5, AQ15, Forty-Niner, CN2, QRAS, and discretization algorithms are covered. *(Fall, Alternate years) (Evenings)*

CSCI 6163. Data Warehousing. (3) Prerequisite: CSCI 6160 or equivalent. Topics include: use of data in discovery of knowledge and decision making; the limitations of relational databases and SQL queries; the warehouse data models: multidimensional, star, snowflake; architecture of data warehouse and the process of warehouse construction; data consolidation from various sources; optimization; techniques for data transformation and knowledge extraction; relations with enterprise modeling. *(Fall, Alternate years) (Evenings)*

CSCI 6164. Design and Implementation of On-line Management Information Systems. (3) Prerequisites: CSCI 6114 or consent of the department. The fundamental concepts and philosophy of planning and implementing an on-line computer system. Characteristics of on-line systems; hardware requirements; modeling of on-line systems; performance measurement; language choice for on-line systems; organization techniques, security requirements; resource allocation. *(On demand)*

CSCI 6166. Computer Communications and Networks. (3) Prerequisite: CSCI 6114 or consent of the department. Introduction to the concepts of computer networks; their operating systems; and communication between nodes. Types of networks; communications and protocols; routing; message switching; optimization; distributed processing; coding and compaction. *(Spring) (Evenings)*

CSCI 6167. Network and Information Security. (3) Prerequisite: CSCI 6166 or equivalent. Knowledge of object-oriented programming and the Java programming language are assumed. This course examines issues related to network and information security. Topics include security concepts, security attacks and risks, security architectures, security policy management, security mechanisms, cryptography algorithms, security standards, security system interoperation and case studies of the current major security systems. *(On demand)*

CSCI 6170. Logic for Artificial Intelligence. (3) Prerequisite: CSCI 5150 or consent of the department. Introduction to basic concepts of logic for artificial intelligence, including declarative knowledge, inference, resolution, nonmonotonic reasoning, induction, reasoning with uncertain beliefs, distributed information systems, intelligent information systems, planning and intelligent-agent architecture. *(On demand)*

CSCI 6175. Computability and Complexity. (3) Prerequisite: consent of the department. Study of computability, unsolvability, computational complexity. Concept of effective computability; recursive functions; mathematical models of computation; universal Turing machines; unsolvable problems; time and space complexity of computations; NP-completeness problems; subrecursive hierarchies. *(On demand)*

CSCI 6181. Switching and Automata Theory. (3) Prerequisite: consent of the department. Topics include sets, relations, lattices, Boolean algebra; functional decomposition and symmetric functions; threshold logic; multiple-valued logic; fault detection and fault tolerant design; finite state machines, incompletely specified machines, minimization; state identification and fault detection experiments; finite state recognizers. *(On demand)*

CSCI 6182. Advanced Computer Architecture. (3) Prerequisite: CSCI 5141. Survey of existing and proposed architectures; pipelined, dataflow, restructurable, and supercomputer architectures. Multicomputer and multi-processor architectures. Impact of VLSI on architecture. *(Spring, Alternate years) (Evenings)*

CSCI 6184. Fault Tolerant Digital Systems. (3) Prerequisite: CSCI 5141. Design and analysis of fault tolerant digital systems including design techniques, qualitative and quantitative methods of evaluation, and available fault tolerant digital systems. *(Fall, Alternate years) (Evenings)*

CSCI 6186. Microelectronics System Design and Simulation. (3) Prerequisite: CSCI 5141. Project oriented course on techniques and methodology in design and development of microelectronics systems including system specifications, hardware design of specific building blocks, simulation and iterative refinement of system boards, interface structure and data communication,

interconnection architecture, printed circuit boards, and techniques for testing and debugging. *(Fall, Alternate years) (Evenings)*

CSCI 6690. Computer Science Seminar. (3) Prerequisites: at least 18 graduate CSCI/CSCI hours and consent of department. Experience for the advanced M.S. student on current problems of computer design and application. (May be used by a student or small group of students to work with a professor on a topic of mutual interest. May be used to give a course on a topic announced in advance.) *(On demand)*

CSCI 6880. Individual Study. (1-3) Prerequisites: At least 18 graduate CSCI/CSCI hours and consent of department. With the direction of a faculty member, students plan and implement appropriate objectives and learning activities to develop specific areas of expertise through research, reading, and individual projects. May be repeated for credit. *(On demand)*

CSCI 7991. Computer Science Thesis. (1-3) Prerequisite: consent of department. Graduate thesis research. Detailed exploration of an area of computer science chosen for thesis research. May be repeated for credit but no more than six hours may be applied to M.S. degree requirements. *(Fall, Spring, Summer)*

CSCI 7999. Master's Degree Graduate Residence. (0) See Department for Course Description.

COUNSELING

Department of Counseling, Special Education, and Child Development

5055 Colvard Building
(704) 547-2531

Degree

M.A.

Coordinator

Dr. Mary Thomas Burke

The M.A. program in Counseling is accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP) in both school counseling and community counseling. Both specializations qualify graduates for certification as practicing counselors in North Carolina and for certification eligibility by the National Board of Certified Counselors. The school counseling specialization includes options in both elementary and secondary school counseling, and it qualifies graduates for advanced-level licensure in K-12 counseling in North Carolina.

Program Objectives

As prospective professional counselors, graduates of the program are prepared to: counsel clients, both individually and in groups, on educational, career, life planning, social, emotional, physical, spiritual, and organizational concerns; provide information to clients for educational, social, career, and/or life planning; consult with other professionals concerning client needs; and conduct needs assessments, evaluations, and other activities for program design.

Additional Admission Requirements

In addition to the general requirements for admission to the Graduate School, the criteria for admission to the M.A. program in Counseling include an applicant's potential success in forming effective interpersonal relationships in individual and small-group contexts; aptitude for graduate-level study; vocational goals and objectives; openness to self-examination; and potential for personal and professional self-development. Admission decisions are based on applicants' individual profiles and made by a committee of program faculty. Applicants with the highest profile rankings are invited to campus for a day-long interview process; the number invited is determined by the number of anticipated openings in the program. Students are admitted to the program in the spring of each year, and they are expected to begin their studies the following summer or fall. The application deadline for each year's admissions process is January 15.

Degree Requirements

The M.A. program in Counseling requires a total of 60 hours of core courses for all students and specialization courses for students in either *school counseling* or *community counseling*. Both specializations include a series of required courses, clinical experience courses and elective courses.

Core Courses for All Students (33 hours)

CHFD 6102	Learning and Development (3)
RSCH 6101	Educational Research Methods
RSCH 6109	Assessment and Evaluation Methods (3)
CSLG 6100	Counseling Theories (3)
CSLG 6101	Ethical and Professional Issues in Counseling (3)
CSLG 6110	Counseling Techniques (3)
CSLG 6111	Advanced Counseling Techniques (3)
CSLG 6120	Group Counseling (3)
CSLG 6121	The Leadership and Design of Structured Groups (3)
CSLG 6145	Multicultural Counseling (3)
CSLG 6150	Career and Lifestyle Development (3)

School Counseling Specialization Courses (27 hours)
Required Course (3 hours)

CSLG 7141	The School Counselor (3)

Clinical Experience Courses (9 hours)
Two of the three courses must be in a school setting:
- CSLG 7430 Practicum in Counseling and Guidance (3)
- CSLG 7435 Internship (3)
- CSLG 7436 Advanced Internship (3)

Elective Courses (15 hours)
These courses must be approved by the student's advisor.

Community Counseling Specialization Courses (27 hours)
Required Courses (6 hours)
- CSLG 7170 Community Counseling and Management (3)
- PSYC 6153 Classification of Psychological Dysfunctions (3)

Clinical Experience Courses (9 hours)
Two of the three courses must be in a community setting:
- CSLG 7430 Practicum in Counseling and Guidance (3)
- CSLG 7435 Internship (3)
- CSLG 7436 Advanced Internship (3)

Elective Courses (12 hours)
These courses must be approved by the student's advisor.

Admission to Candidacy

In addition to meeting Graduate School academic regulations, counseling students should submit a completed Application for Admission to Candidacy when they submit their application for the program's capstone experience to the Department of Counseling, Special Education, and Child Development.

Capstone Experience

Students must successfully complete either a written comprehensive examination or a master's project near the end of their program of study. Students are expected to consult with their advisors during the first 24 hours of course work concerning procedures and preparation for this capstone experience.

Courses in Counseling

CSLG 6000. Topics in Counseling. (1-6) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

CSLG 6100. Counseling Theories. (3) Examination of the counseling relationship from various theoretical frameworks, including client-centered, psychoanalytic, Gestalt, transactional analysis, rational emotive, reality, and behavior theories. *(Fall, Summer)*

CSLG 6101. Ethical and Professional Issues In Counseling. (3) Ethical and legal responsibilities, ethical standards, interpretations of laws by local authorities, and court decisions that impact the counseling profession. Skills of practical, ethical, and legal consultation are also emphasized. *(Fall, Summer)*

CSLG 6109. Research in Counseling. (3) Examination of principles and practices for research and development of programs in counseling with emphasis on developmental designs, preventive programs, objectives and organizations. *(On demand)*

CSLG 6110. Counseling Techniques. (3) Examination of concepts of individual counseling and the means for establishing facilitative relationships including competence in basic counseling skills and interventions. *(Fall, Spring)*

CSLG 6111. Advanced Counseling Techniques. (3) Prerequisites: CSLG 6100 and 6110. Counseling interventions useful in facilitating client change and growth from an action-oriented, problem management perspective. Strategies for cognitive, affective, and behavioral change will be practiced. *(Fall, Spring)*

CSLG 6115. Person-to-Person Relationships. (3) Examination of concepts and methods for improving human relationships. This course has an experiential component. *(On demand)*

CSLG 6120. Group Counseling. (3) Investigation of concepts of group counseling and the means for developing facilitative interaction in groups which will include an experiential component as a major learning activity. *(Fall, Spring)*

CSLG 6121. The Leadership and Design of Structured Groups. (3) Methods of creating psychoeducational groups. Focus on applying psychological theories to the selection of group content. Leadership issues such as screening, dealing with difficult members, and leader roles are addressed. *(Fall, Spring)*

CSLG 6145. Multicultural Counseling. (3) Approaches to counseling that focus on multicultural differences so the counselor will be more effective in dealing with clients from a variety of cultural backgrounds. *(Fall, Summer)*

CSLG 6150. Career and Lifestyle Development. (3) A counseling-oriented course designed to help the counselor and/or career education teacher develop the ability to use career information with emphasis on understanding of occupational information, systems of collection and usage forms. *(Spring, Summer)*

CSLG 6152. Approaches to Career Development (K-12). (3) Counselors and vocational development coordinators gain an understanding and skills necessary for 1) the development, management and evaluation of a comprehensive, competency-based K-12 career education/ counseling program, 2) infusing career education into K-12 curriculum in a counselor/consultant

capacity, and 3) establishing and leading successful individual and group career development activities. *(On demand)*

CSLG 6160. Theories of Chemical Dependence. (3) Prerequisite: None. Corequisite: None. Introduction to the theoretical, philosophical, and historical premises upon which chemical dependence is explained and treatment and prevention are based. Biological, psychological, and sociological etiologies of substance abuse and dependence are studied. *(Alternate Fall, Even years)*

CSLG 6161. Chemical Dependence: Assessment and Diagnosis. (3) Prerequisite: None. Corequisite: None. Process and procedures for professional biopsychosocial assessment and diagnosis of substance abuse and dependence in adolescents and adults are studied. Implications of chemical dependence for clients and their families are addressed. *(Alternate Spring, Odd years)*

CSLG 6200. Introduction to Theories of Family Counseling. (3) Examination of appropriate interventions in working with families focusing on major theorists and techniques in the field *(On demand)*

CSLG 6201. Counseling Needs of Women. (3) Women's development and needs, the problems they bring to counselors, strategies for helping with them, myths about women and biases in psychological research. *(On demand)*

CSLG 6800. Individual Study in Counseling. (1-6) Prerequisite: Permission of the student's adviser. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

CSLG 7110. Individual Assessment. (3) Prerequisite: RSCH 6109 or PSYC 4140. Examination of the major aptitude, intelligence and other psychological tests commonly used in counseling with emphasis on test theory as well as the administration, scoring and interpretation of tests and the communication of their results. *(On demand)*

CSLG 7120. Administration and Supervision of Counseling Services. (3) Planning, operation, implementation and supervision of counseling and guidance services in schools and agencies with emphasis on the development of administrative and supervisory skills. *(On demand)*

CSLG 7140. Elementary School Counseling and Guidance. (3) Introduction to the guidance function in the elementary school with emphasis on the counselor's role in counseling, consulting and coordinating school and community resources for the optimum benefit of the child. *(On demand)*

CSLG 7141. The School Counselor. (3) Development of functional skills necessary for integration of counseling activities into school curriculum. Focus on the role of the counselor in counseling individuals, small group counseling, classroom guidance, consultation, program design, coordinating school and community resources, and administration of special programs. *(Spring)*

CSLG 7142. Introduction to Play Therapy. (3) Prerequisite: None. Corequisite: None. Examination of concepts of play therapy and the means for establishing facilitative relationship with children under the age of ten years. *(On demand)*

CSLG 7143. Filial Therapy: Extending Play Therapy Skills to Parents. (3) Prerequisite: CSLG 7142. Corequisite: None. Introduces concepts and skills for training parents to be therapeutic agents in their children's lives through the utilization of play therapy skills. *(On demand)*

CSLG 7151. Approaches to Adult Career Development. (3) Prerequisite: CSLG 6150. For the career development specialist who needs to survey an environment in which adults are seeking career counseling; assess needs; develop interventions strategies to meet needs; and assess outcomes. *(On demand)*

CSLG 7153. Research Techniques and Computer Applications in Career Counseling. (3) Prerequisites: RSCH 6101, 6109 and 6110. Skills in preparing a literature review upon which to base a research study; critiquing theoretical, philosophical, and research material and reports; and conducting and reporting a research study. Focus on understanding the effective application of computer technology to the provision of career-related services in mental health, education, rehabilitative or other human services settings. *(On demand)*

CSLG 7170. Community Counseling and Management. (3) Counseling in community agency settings, including the roles and functions of a professional counselor, assessing the needs of an agency population and the interworkings of various agencies and agency networks. *(Fall)*

CSLG 7190. Introduction to Pastoral Counseling. (3) Prerequisites: CSLG 6100, 6110. Introduction to the field of pastoral counseling including both theological and counseling dimensions. *(On demand)*

CSLG 7191. Advanced Issues in Pastoral Counseling. (3) Prerequisite: CSLG 7190. Specific content relevant to pastoral counseling including didactic and experiential foci. *(On demand)*

CSLG 7205. Techniques of Family Counseling. (3) Prerequisites: CSLG 6100, 6200. An overview of techniques used by family counselors working from

communications, structural or strategic orientations. *(On demand)*

CSLG 7430. Practicum in Counseling and Guidance. (3) Prerequisites: CSLG 6100 and 6110. Supervision of individual and group counseling interventions conducted in field settings; special attention to the development of evaluative criteria for self and peer assessment. A minimum of 10 hours per week in field placement. Offered on a pass/no credit basis. May be repeated once for credit with departmental approval. *(Fall, Spring)*

CSLG 7435. Internship. (3) Prerequisite: CSLG 7430. Students will participate in delivering counseling services in a field setting and receive supervision of their work in weekly seminars. A minimum of 20 hours per week in field placement. Offered on a pass/no credit basis. *(Fall, Spring)*

CSLG 7436. Advanced Internship. (3) Prerequisite: CSLG 7435. Continuation of CSLG 7435. Students will function as counselors in field settings and have the opportunity to demonstrate advanced level skills in weekly seminars. A minimum of 20 hours per week in field placement. *(Fall, Spring)*

CSLG 7800. Individual Study in Counseling. (1-6) Prerequisite of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

CSLG 7999. Graduate Residence. (0) Meets Graduate School requirement for continuous enrollment during completion of capstone project or comprehensive examination. *(Fall, Spring)*

CRIMINAL JUSTICE

Department of Criminal Justice

2260 Garinger Building
(704) 547-2652

Degree

M.S.

Coordinator

Dr. Anita Blowers

Graduate Faculty

Beth Bjerregaard, Associate Professor
Anita Blowers, Associate Professor
Pauline Breenan, Assistant Professor
Charisse Coston, Associate Professor
Charles Dean, Professor
Paul Friday, Professor
David Hirschel, Professor Emeritus
Vivian Lord, Associate Professor

Program of Study

The Master of Science degree program in Criminal Justice is designed to promote broad based study of the phenomenon of crime and to enhance career opportunities in the field of criminal justice. The program utilizes the social and behavioral sciences in an interdisciplinary approach to study law, crime, and social deviance, and to examine critically the systems created in response to deviance and crime. The objectives of the program are to: (1) provide present and future criminal justice personnel with the educational background necessary to function effectively in the dynamic field of criminal justice; (2) familiarize students with the nature, methods, and functions of research, and with the existing body of knowledge on criminal justice; (3) provide the criminal justice system with qualified candidates for careers in the field; and (4) prepare students for entrance into doctoral programs. Career opportunities available in the criminal justice system include law enforcement, corrections, administration, planning and analysis, juvenile justice, and college instruction. There are also private sector careers available, including private security. Students may enroll in the program on either a full-time or part-time basis. Classes usually are scheduled in the evening to accommodate the part-time student.

Additional Admission Requirements

Admission to the Criminal Justice graduate program is open to students with bachelor's degrees in any discipline who meet the general requirements for admission to the Graduate School, provided they meet the following requirements. Applicants must have a grade point average of at least 2.75 and a satisfactory score on the Graduate Record Examination (GRE) or the Miller Analogies Test (MAT). To ensure competence in the basic concepts of criminal justice, incoming students must demonstrate or establish proficiency with the materials offered in the following three undergraduate courses: CJUS 1100 (Introduction to Criminal Justice); CJUS 3100 (Criminal Justice Theory); and CJUS 3101 (Research Methods in Criminal Justice).

Degree Requirements

A minimum of 36 semester hours is required. Eighteen of these 36 hours must be in courses open only to graduate students (6000 level and above). All students must complete each of the following five core courses with a grade of *B* or above: CJUS 6100 (The Criminal Justice System); CJUS 6101 (The Nature and Theory of Crime); CJUS 6102 (Research in Criminal Justice I); CJUS 6103 (Research in Criminal Justice II); and CJUS 6104 (Criminal Justice and Social Control). A maximum of 12 hours may be taken outside the Criminal Justice Department, and a maximum of six hours with grades of *B* or above may be transferred from another institution. Transfer courses must be consistent with the program and will be accepted at the discretion of the department. At least 30 semester hours must be taken in residence. Students must complete one of the following options:

1) passing 36 semester hours of coursework and a comprehensive written examination; or (2) preparing a thesis which counts as six of the required 36 semester hours. A thesis, an extensive research project, may encompass a philosophical, theoretical, methodological, legal, or empirical approach to the study of crime or criminal justice. To enter the thesis track, a student must form a thesis committee of three faculty members, two of which must be from the Criminal Justice faculty.

Assistantships

The Criminal Justice Department offers graduate assistantships which are awarded solely on the basis of academic merit.

Financial Aid

In addition to the graduate assistantships, the department offers, as available, research assistantships and grant-funded opportunities for students. In addition, the competitive Dean Reep Scholarship is available for an incoming graduate student each year.

Comprehensive Examination

The comprehensive examination is offered each year in November and April. Since the examination requires integration of materials covered in all graduate courses, it is recommended that it be taken close to the completion of the degree. However, anyone who has successfully completed 21 semester hours, including passing all five core courses with *B* or above, is eligible to take the examination. The comprehensive examination may be taken no more than two times.

Courses in Criminal Justice

CJUS 5000. Topics in Criminal Justice. (3) Specialized criminal justice topics. May be repeated for credit. *(Fall, Spring)*

CJUS 5101. Drugs, Crime and the Criminal Justice System. (3) Use of drugs and their relationship to crime including the impact of drugs on the individual and the criminal justice system. *(On demand)*

CJUS 5103. International Criminal Justice. (3) Examination of the criminal justice systems of the United States and other nations. *(On demand)*

CJUS 5161. Violence and the Violent Offender (3) Issues surrounding violence in today's society and their impact on offenders involved in homicide, child and domestic abuse, and other forms of violence. Examination of myths about violence, victim-offender characteristics and relationships, and theories of violence. *(On demand)*

CJUS 6000. Topics in Criminal Justice (3-6) Specialized criminal justice topics. May be repeated for credit. *(On demand)*

CJUS 6100. The Criminal Justice System. (3) Major subsystems of the criminal justice system including law enforcement, criminal courts, correctional agencies, and the juvenile offender subsystem. Linkage of these subsystems to each other and to the community and society at large. *(Fall)*

CJUS 6101. The Nature and Theory of Crime. (3) Definitions and patterns of criminal behavior. Major theoretical perspectives on crime, including historical, philosophical, individual, community-oriented and societal approaches. *(Fall)*

CJUS 6102. Research in Criminal Justice I. (3) Introduction to research methodology and statistics with emphasis on applications to criminal justice settings. Topics to be covered include problem selection, theory, hypothesis formulation, research design, sampling, measurement and proposal writing. *(Spring)*

CJUS 6103. Research in Criminal Justice II. (3) Prerequisite: CJUS 6102. Advanced research methodology with emphasis on conducting, presenting and evaluating research in criminal justice settings. Topics to be covered include data collection, data input, data analysis, interpretation. *(Fall)*

CJUS 6104. Criminal Justice and Social Control. (3) Ethical issues of social control and criminal and civil law responses to such issues. Examination and critiques of assumptions underlying systems of social control, especially as they relate to the application of sanctions and treatment to such issues as mental illness and drug addiction and alcoholism. *(Spring)*

CJUS 6120. Criminal Justice Management and Decision-Making. (3) Application of generic principles of management and supervision to operational problems confronted by criminal justice agencies with particular attention to decision- making and discretion in criminal justice settings. *(On demand)*

CJUS 6130. Law Enforcement Systems. (3) Consideration of the elements of law enforcement agencies as subsystems of the total criminal justice system. Comparisons of law enforcement systems in other countries is also considered. *(On demand)*

CJUS 6131. Police Problems and Practices. (3) Research on current issues in law enforcement with emphasis on the legal, social, and institutional contexts in which they occur. (On demand)

CJUS 6132. Legal Issues in Law Enforcement. (3) Law applicable to the functions of police administrators and line police officers including constitutional, statutory, judicial, and administrative law governing search and seizure, arrest, interrogation, use of force, jurisdiction, civil and criminal liability of administrators and officers, and the rights of officers and suspects. *(On demand)*

CJUS 6140. Prosecution and Adjudication Processes. (3) Functions and powers of prosecutors, defense attorneys, judges and juries including plea bargaining and court procedure. *(On demand)*

CJUS 6150. Corrections. (3) Functions of correctional agencies, principles of punishment and a historical analysis of correctional institutions and programs including prisons, jails, probation and parole systems. *(On demand)*

CJUS 6151. Correctional Strategies: Rehabilitation and Reintegration. (3) Efforts to change offender behavior and to facilitate the development of offender-community linkages. Institutional classification and treatment strategies, pre-release and temporary release programs, innovative uses of probation and parole systems, community residential programs and new dispositional models; e.g., sentencing to community service and restitution. *(On demand)*

CJUS 6152. Legal Issues in Corrections. (3) Major legal issues pertaining to corrections, including sentencing, probation, restitution, prisons, parole, pardon and restoration of rights with emphasis on legal issues often confronted by correctional administrators and probation and parole personnel. *(On demand)*

CJUS 6160. Juvenile Justice Systems. (3) The process by which specific behaviors are identified as delinquent and the responses of the juvenile justice system to such behaviors. Laws dealing with the juvenile justice system, the historical development of the system, and the effectiveness of innovative responses to delinquency. *(On demand)*

CJUS 6170. Program Planning and Evaluation in Criminal Justice. (3) Applied research as a foundation for criminal justice planning and evaluation. Emphasis on the interrelationship of planning and evaluation within program management. *(On demand)*

CJUS 6800. Directed Individual Study in Criminal Justice. (3) Supervised investigation of a criminal justice problem of special interest to the student. May be repeated one time with the approval of the student's major professor or academic committee. *(Fall, Spring)*

CJUS 6900. Thesis. (6) Independent research of a significant criminal justice topic approved by the student's academic committee. *(Fall, Spring)*

CJUS 7999. Graduate Residence (0) Continuation of work for the thesis or comprehensive exam.

ECONOMICS

Department of Economics

220 Friday Building
(704) 547-2185
http://www.uncc.edu/colleges/business/economics/MS/ms.htm

Degree

M.S.

Coordinator

Dr. John E. Connaughton

Graduate Faculty

L. Ted Amato, Professor
John E. Connaughton, Professor
W. Young Davis, Professor
Carol A. Dole, Assistant Professor
John M. Gandar, Professor
Hwan Lin, Associate Professor
Gaines H. Liner, Associate Professor
Ronald A. Madsen, Professor
Rob Roy McGregor III, Associate Professor
Dr. Benjamin Russo, Associate Professor
Dr. Peter M. Schwarz, Professor
Dr. Ellen Sewell, Assistant Professor
Dr. Jennifer Troyer, Assistant Professor
Dr. Alice Tseng, Associate Professor
Dr. Irvin B. Tucker III, Associate Professor
Dr. Richard A. Zuber, Professor

Program of Study

The Master of Science degree program in Economics features a curriculum that is flexible yet thorough in its approach to theoretical training and applied course work. The program offers concentrations in Economics and in Economics/Finance. Students who complete this program are prepared for staff and management positions that require the integration of economic analysis and advanced quantitative methods. Employment opportunities for economists with a master's degree exist in both the public and private sectors. In addition, students with a master's degree may choose to pursue additional graduate education leading to a doctoral degree in Economics or in Finance.

Additional Admission Requirements

In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Economics:

1) Undergraduate coursework that includes: Calculus, Statistics (or Econometrics), Intermediate Macroeconomic Theory, Intermediate Microeconomic Theory, and Mathematical Economics. (Students missing some of these courses can be admitted conditionally.)

2) A satisfactory score on the aptitude portions of the Graduate Record Examination. The Graduate Management Aptitude Test may be substituted for the GRE with the permission of the program coordinator.

Degree Requirements

The program leading to the Master of Science degree in Economics requires at least 30 hours of graduate credit, with a maximum of six hours of transfer credit accepted from an accredited institution. (Credit applied toward an awarded graduate degree will not be accepted as transfer credit.) Courses taken at other accredited institutions after enrollment may receive residence credit if approved by the department and the Dean of the Graduate School. At least half of the credit hours applied toward the degree must be in courses open only to graduate students. No more than two C's are permitted in the program and at least 18 semester hours must be completed before admission to candidacy. A GPA of at least 3.0 is required to graduate. The program is organized into three curriculum components:

1) a core curriculum in economic theory, econometrics, and forecasting;
2) an individualized curriculum of interrelated coursework; and
3) a research project tailored to the needs of terminal master's students or a thesis for students considering doctoral study in economics.

Admission to Candidacy Requirements

An Admission to Candidacy form listing graduate-level course that apply to the degree must be submitted to the program coordinator one month prior to the semester in which the student plans to complete the course work for the degree.

Assistantships

A number of graduate assistantships are available each year. To be fully competitive, applications must be submitted by March 15. Further information is available in the Economics Department.

Core Courses

ECON 6201 Advanced Macroeconomic Theory (3)
ECON 6202 Advanced Microeconomic Theory (3)
ECON 6112 Graduate Econometrics (3)
ECON 6218 Advanced Business and Economic Forecasting (3)

In addition, students who choose to complete a thesis must successfully complete ECON 6999 (Master's Thesis), while students enrolled in the non-thesis option must complete ECON 6901 and ECON 6902 (Research Methods I and Research Methods II).

Track Descriptions

1) Individualized Curriculum

The purpose of the individualized curriculum is to provide students with the opportunity to acquire specialized theoretical skills related to their areas of interest and expertise. Elective fields of interest could include monetary policy, finance and banking, international trade and international finance, economic analysis for business decision making, urban economics, or economic and business forecasting. The program also permits the development of individualized specializations in areas that are complementary to economic theory and analysis.

2) Economics/Finance Concentration

The Economics/Finance Concentration is designed for students seeking careers in banking or other financial institutions, as well as regulatory bodies dealing with financial markets. The Economics/Finance concentration can also provide an excellent foundation for students who wish to pursue additional graduate study leading to a Ph.D. or D.B.A. degree in Finance.

The Economics/Finance major must complete the core curriculum for the M.S. in Economics and the thesis or research project. In addition, the Economics/Finance major must complete the following:

FINN 6152 Financial Management (3) (Prerequisite: MBAD 6131 or 6 hours of undergraduate accounting and approval of the Graduate Coordinator).
FINN 6157 Theory of Corporate Finance (3)

One of the following:

FINN 6151 Financial Institutions and Markets (3)
FINN 6153 Investment Management (3)
FINN 6155 Multinational Finance (3)
FINN 6156 Commercial Bank Management (3)

Minors

The Department of Economics also participates in the program leading to an interdisciplinary graduate minor in Operations Research. See Operations Research Section of this Catalog for complete information and program requirements.

Advising

Prior to, or concurrent with, the first semester of study, each student will be expected to complete a program of study listing each class the student expects to take as a part of the program.

Thesis

Students may choose the thesis track or the non-thesis option. Students who choose the thesis track must successfully complete ECON 6999 (Master's Thesis), while students enrolled in the non-thesis option must

complete ECON 6901 and ECON 6902 (Research Methods I and Research Methods II).

Application for Degree
An Application for Degree form must be completed and submitted with the graduation fee to the Registrar's Office by the published deadline.

Tuition Waivers
In-State and Out-of-State Tuition Waivers. A limited number of tuition waivers are made available each year. These waivers are competitively awarded using the same application required for assistantships.

Program Certifications/Accreditations
The Belk College of Business is accredited by the American Association of Collegiate Schools of Business (AACSB).

COURSES IN ECONOMICS

ECON 5102. Economics for School Teachers. (3) Prerequisite: permission of the instructor for students not majoring in education. Emphasis on economic concepts and issues that lend themselves to grades K-12 classroom presentation. Includes the development, meaning, and functioning of institutions that characterize the U.S. economy. Not accepted for graduate credit in the M.B.A. program or M.S. in Economics program. *(Fall, Spring)*

ECON 5105. Negotiations and Bargaining Strategy. (3) Theories of negotiation strategy. Emphasis on the negotiation of collective bargaining contracts. Topics include the use of arbitration, mediation, conciliation and fact-finding boards to resolve disputes. *(On demand)*

ECON 5116. Public Sector Economics. (3) Revenue and expenditure problems of governmental units, intergovernmental financial relationships and the impact of federal fiscal policy upon the American economy. *(On demand)*

ECON 5135. Economics of Development. (3) Theories of economic growth and development applied to varying economic and social systems. Current theoretical models and their relevance to efficient allocation of resources to both the developed and the developing nations. *(On demand)*

ECON 5160. Economics of Transportation. (3) Analysis of transportation systems. Topics include the historical development of various modes; costs and rate-making, regulation and national transportation policy. *(On demand)*

ECON 5171. Economics of International Trade. (3) Theory of international trade including determination of international trade patterns, welfare implications of international trade, economic integration, and effects of tariffs and quotas. *(Fall)*

ECON 5172. Economics of International Finance. (3) Survey of international monetary theory. Topics include exchange rate determination, balance of payments and adjustment, international liquidity, capital movements, international financial organizations, and monetary reform proposals. *(On demand)*

ECON 5177. History of Economic Thought. (3) History of economics as a science and the evolution of theories of value, distribution and employment. Review of the works of Adam Smith, Thomas Malthus, David Ricardo, Karl Marx, Alfred Marshall, Thorstein Veblen, and John Maynard Keynes. *(Spring)*

ECON 5180. Industrial Organization and Public Policy. (3) An examination of monopolistic competition, oligopoly, and monopoly and questions of public policy in dealing with problems created by industrial concentration. *(Fall)*

ECON 5181. Energy and Environmental Economics. (3) Economic issues of both energy and environment. Energy issues include the historical development of energy resources, supply and demand considerations, and projections of the future energy balance. Environmental issues are externalities, common property resources, and government regulation. Policy considerations include environmental standards, pollution charges, and property rights. Cost-benefit analysis and microeconomic theory are applied. *(On demand)*

ECON 5182. Public Utilities. (3) Economic issues of public utilities, with emphasis on the theory and methods of rate-making and regulation. *(On demand)*

ECON 6001. Advanced Topics in Macroeconomics. (3) Prerequisites: ECON 6112, 6201 and 6202. Advanced treatment of selected issues in macroeconomics. *(On demand)*

ECON 6002. Advanced Topics in Microeconomics. (3) Prerequisites: ECON 6112, 6201 and 6202. Advanced treatment of selected issues in microeconomics. *(On demand)*

ECON 6090. Topics in Economics. (1-3) Prerequisite: consent of the department. Topics from various areas of economics. Credit hours will vary with the topic offered. May be repeated for credit as topics vary. *(On demand)*

ECON 6100. Graduate Mathematical Economics. (3) Economic problems are analyzed with quantitative techniques. Topics covered include the study of economic growth models, utility maximization, homogeneous functions, dynamic systems, applications of linear programming, and constrained optimization. *(On demand)*

ECON 6112. Graduate Econometrics. (3) Advanced study of the theory and application of statistics to economic problems. Topics include derivation of least-squares estimators; maximum likelihood estimation; and problems of multicollinearity, heteroskedasticity, and autocorrelation. *(Fall)*

ECON 6120. Economics of Futures and Options Markets. (3) Prerequisites: ECON 6112, 6202. Analysis of futures and options markets. Topics include: theory and application of rational expectations to commodity futures and options, theory and application of economics under uncertainty, statistical behavior of commodity futures and options prices, hedging, regulation of commodity futures markets, and analysis of the success and failure of commodity futures contracts. *(On demand)*

ECON 6201. Advanced Macroeconomic Theory. (3) Prerequisites: Admission to graduate program. Theories of aggregate income determination, inflation, unemployment, interest rates and economic growth; macro-economic consumption and investment behavior; the business cycle. *(Fall)*

ECON 6202. Advanced Microeconomic Theory. (3) Prerequisite: admission to graduate program. Theories of the firm, of the consumer, and of resource owners; determination of prices under different market structures; general equilibrium analysis and welfare economics. *(Fall)*

ECON 6218. Advanced Business and Economic Forecasting. (3) Prerequisite: ECON 6112. Develops forecasting techniques used in business decision making and techniques used in forecasting macroeconomic variables. Topics include: estimation, identification and prediction using ARMAX, state space, and Box-Jenkins models; spectral analysis; linear filtering. *(Spring)*

ECON 6235. Monetary and Financial Theory. (3) Prerequisites: ECON 6112 and either ECON 6201 or 6202. Theory and empirical tests of money supply, money demand, and financial markets; portfolio theory with special attention to portfolio choices of banks; term structure of interest rates; dynamic models of money and economic activity. *(On demand)*

ECON 6240. Economics of International Finance. (3) Prerequisites: ECON 6112, 6201 and 6202. Open economy macroeconomics, international transmission of inflation and unemployment, internal and external balance; balance of payments and international payments mechanisms; determination of exchange rates and effects of hedging and speculation. *(On demand)*

ECON 6241. Economics of International Trade. (3) Prerequisites: ECON 6112, 6201 and 6202. Examines the causes and consequences of trade using Ricardian and neoclassical models. Considers extensions, modifications, and empirical tests of these models. Analysis of tariffs, quotas, other trade restrictions, export subsidies, and trends in current trade policy. *(On demand)*

ECON 6250. Advanced Urban and Regional Economics. (3) Prerequisite: admission to graduate program. Applications of microeconomic theory to problems of cities, metropolitan areas and regions; methods in regional analysis, location theory, land-use planning, measurement of economic activity; transportation, housing, poverty, and growth issues. *(On demand)*

ECON 6255. Benefit-Cost Analysis. (3) Principles, practices, and applications for defining and comparing the benefits and costs of public policy programs and private sector projects, including techniques useful for organizing and analyzing data, evaluating programs systematically, and developing a framework for decision making while recognizing ethical implications, measurement problems, and time value problems. *(Spring)*

ECON 6260. Managerial Decision Making. (3) Prerequisites: ECON 6112, 6201 and 6202. Decision making by firms; demand and production functions; relation between cost and production functions; risk analysis. *(On demand)*

ECON 6800. Directed Study in Economics. (1-3) Prerequisites: Admission to M.S. program in Economics. Independent study of a theoretical and/or a policy problem in a special area of economics. Topics of the investigation may originate from the student or from the faculty member supervising the study. May be repeated for up to 6 hours of credit with the approval of the program coordinator. *(On demand)*

ECON 6901. Research Methods for Economists I. (3) Prerequisites: ECON 6112, 6202 and either ECON 6201 or MBAD/FINN 6157. Research programs in economics; problem identification; interpretation of statistical results; bibliographic search; data sources and collection; selection of statistical technique; preparation of reports and proposals. *(Spring)*

ECON 6902. Research Methods for Economists II. (3) Prerequisites: ECON 6901. Critique of economic research and reports, presentation of econometric results and reports. The student will develop a research project, perform statistical tests, and present the results orally and in a major research paper. *(Summer)*

ECON 6999. Graduate Thesis Research. (0-6) Individual investigation culminating in the preparation and presentation of a thesis. May be repeated for credit. *(On demand)*

EDUCATION

CHILD AND FAMILY STUDIES: EARLY EDUCATION

Department of Counseling, Special Education, and Child Development
5055 Colvard Building
(704) 547-2531
http://www.uncc.edu/colleges/education/cspc/main.htm

Degree
M.Ed.

Coordinator
Dr. Bobbie H. Rowland

Graduate Faculty
Lyn Rhoden, Assistant Professor
Bobbie Rowland, Professor
Bryan Robinson, Professor
Jane Diane Smith, Assistant Professor
JoAnn Springs, Assistant Professor

Overview
The M.Ed. in Child and Family Studies: Early Education prepares professionals for leadership positions that serve young children and their families. It is conveniently designed for prospective students already working full-time in professional settings who wish to pursue an advanced degree on a part-time basis and for those who wish to pursue a degree on a full-time basis. Students specialize in one of five areas of study: classroom teaching, family studies, special needs/special education, administration/supervision, or an individually planned option.

Program of Study
The graduate degree program is for professionals who teach in infant, toddler, and preschool and kindergarten settings; who administer preschool and family agency programs that have a child development and family relations focus; who work as consultants, parent educators, program coordinators, supervisors, and staff development trainers; or who seek research and evaluation expertise in child and family studies and community leadership in child and family programs. Graduates will qualify for the Master's Level "advanced competencies" Birth-Kindergarten (B-K) Teaching License issued by the North Carolina Department of Public Instruction upon completion of the program.

Program Objectives
The M.Ed. degree in Child and Family Studies: Early Education prepares each advanced master's degree student with skills to:

1) Integrate and apply empirical and theoretical knowledge of the growth and development of typically and atypically developing children.
2) Conduct research on individual and family development and behavior
3) Employ interdisciplinary approaches to the study of child development, the family, and other social institutions that include the influence of social context and policy variables on children and their families.
4) Take leadership roles in programs that support the development of infant, toddler, preschool, and kindergarten children.
5) Demonstrate advanced knowledge and understanding of interrelationships of families, family dynamics, and children within these contexts.
6) Design and evaluate inclusive learning environments that promote the development of children of various developmental levels and abilities.

Additional Admissions Requirements
In addition to the general requirements for admission to the Graduate School, applicants must (1) have at least two years of experience working with young children and families and (2) hold the "A" level license in Birth-Kindergarten or a closely related field from the North Carolina Department of Public Instruction (or its equivalent in another state). Applicants who do not hold the Birth-Kindergarten teaching license may be required to take additional coursework.

Degree Requirements
The M.Ed. in Child and Family Studies: Early Education requires a total of 39 semester hours of course work, including 18 hours of core courses, 6 hours of applied research/evaluation, 9 hours of thematic electives, and 6 hours of seminar/internship.

Core Courses (18 hours)

CHFD 6102	Learning and Development (3)
CHFD 6200	Curriculum and Learning Environments for Young Children (3)
CHFD 6210	Inclusive Education for Young Children (3)
CHFD 6220	Family Theory, and Research (3)
CHFD 6230	Emerging Literacy and Mathematical Understanding (3)
CHFD 6000	Topics in Child and Family Development (3)

Applied Research/Evaluation (6 hours)

RSCH 6101	Educational Research Methods (3)
CHFD 6900	Research in Child and Family Studies (3)

Thematic Electives (9 hours)
To be selected from the categories of Education of Young Children; Family Studies; Special Needs/Special Education; Administration/Supervision; or individually planned option, with advisor approval.

Internship/Seminar (6 hours)
CHFD 6400 Internship in Child and Family Studies (3)
CHFD 6600 Seminar: Leadership in the Education of Children and Families (3)

Capstone Experiences
Students have the option of completing either an applied master's project or a research project/thesis related to their specialty area. Either option must be the student's own design and origination under the supervision of an advisor and graduate committee members.

Admission to Candidacy Requirements
Upon successful completion of a minimum of 24 semester hours of graduate work and in no case later than four weeks prior to the beginning of the semester in which he/she expects to complete all requisites for the degree, a student should file for admission to candidacy on a form supplied by the Graduate School. This application is a check sheet approved by the student's advisor, department chairperson and college dean listing all course work to be offered for the degree (including transferred credit and courses in progress).

Assistantships
Each Department in the College of Education funds a limited number of graduate teaching assistantships. Information about these assistantships, including application materials is available in the department office.

Internships
The internship is a supervised, intensive, culminating experience in which students assume a professional role in a child and family development setting and demonstrate the ability to provide direct services, to apply research and theory in a field-based setting, and to assume leadership roles. A minimum of 200 clock hours is required.

Advising
Upon admission, each student is assigned a faculty advisor who helps the student develop his or her program of study and must approve that program of study. Each student must also assemble a graduate committee for consultation and evaluation. Members of the committee include the student's faculty advisor and at least two other faculty members who represent major areas of concentration in the student's program.

Licensure
Graduates will qualify for the Master's Level "advanced competencies" Birth-Kindergarten (B-K) Teaching License issued by the North Carolina Department of Public Instruction upon completion of the program.

Comprehensive Exam
An oral exam may follow the student's master's project/thesis completion. The oral exam is designed to provide the student with feedback from the members of the student's graduate committee about the written project/thesis.

Committees
Students should consult with their academic program advisor in the selection of the committee. The committee members will be appointed by the Dean of the Graduate School upon the recommendation of the student's academic advisor and department chair. At least three members of the committee should hold graduate faculty appointments. The following guidelines are intended to assist the student and his or her academic program advisor in constituting the master's committee.

A) Chair - selected for content knowledge of the subject area that is selected for the culminating experience. This person may be, but need not be, from your department. It is recommended, however, that this person hold a graduate faculty appointment in your department.
B) Second and third members - selected for knowledge and expertise in the subject area (can be external to your department).
C) Technical advisor - (Thesis and Research Projects only) - selected for technical support (e.g., specialized skills in program evaluation, technical writing, assessment, curriculum design, graphics, ethnography, and survey research methodology). This person may be, but need not be from your department.
D) Additional members - may be added if the committee chair agrees. These members may be from departments of the College other than your department, and may be from other colleges in the University or from outside the University with the prior written permission of the Dean of the Graduate School. (This whole process should start at the beginning of the semester prior to graduation. However, the student may begin anytime after completing 18 hours.)

Master's Project/Thesis
The nature of the project/thesis is developed by the student in consultation with the major professor and presented to the Advisory Committee for approval. The project is usually something that is practical and will be useful to the student in the professional role that will be assumed upon the completion of the degree. The thesis takes a more research-oriented approach.

Research Opportunities/Experiences

Students have the option of completing either an applied master's project or a research project/thesis related to their specialty area.

Program Certification/Accreditation

The College of Education is accredited by the National Council for Accreditation of Teacher Education (NCATE) and approved by the North Carolina Department of Public Instruction (NCDPI) to offer a master's degree program in Child and Family Studies: Early Education. Graduates will qualify for the Master's/Advanced Competencies "M" license and prepare them to pursue national certification through the National Board for Professional Teaching Standards (NBPTS).

Courses in Child and Family Development

CHFD 5000. Topics in Child and Family Development. (1-6) May include classroom and/or clinical experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

CHFD 6000. Topics in Child and Family Development. (1-6) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

CHFD 6100. Adjustment Issues: Children in Family Context. (3) Study of adjustment problems of childhood and adolescence with emphasis on the context and patterns of the family-of-origin system that influence behavior and attitudes as children grow and develop. *(On demand)*

CHFD 6102. Learning and Development. (3) In-depth study of selected theories of learning and development. *(Fall, Spring, Summer) (Evenings)*

CHFD 6110. Parenting Education. (3) Prerequisite or corequisite: CHFD 6102. An examination of the principles and practices of parenting education in terms of research, program implementation, evaluation, and collaboration. In-depth study of developmental designs, supportive programs, programs designed to prevent problems, and programs and organizations which repined to parent needs and interests. Emphasis is placed on the process of parent involvement, communication, and collaborative leadership. *(On demand)*

CHFD 6115. Child and Family Advocacy. (3) Prerequisite: CHFD 6102. Study of the principles and practices of child and family advocacy. *(On demand)*

CHFD 6120. Creativity, Learning Environments and Experiences. (3) Investigation of theories of creativity and their relationship to curriculum development. *(On demand)*

CHFD 6130. Concepts of Teaching and Learning: Children's Play. (3) Examination of theories, trends and current practices in children's play. *(On demand)*

CHFD 6200. Curriculum and Learning Environments for Young Children. (3) Prerequisite or corequisite: CHFD 6102. Theoretical and research foundations for designing, implementing, adapting, and evaluating curriculum that is responsive to the needs of young children. Observational strategies are used to assess both the child (individual, sociocultural, and developmental characteristics) and the environment in order to identify best practices. *(Spring)*

CHFD 6210. Inclusive Education for Young Children. (3) Prerequisite or corequisite: CHFD 6102. Inclusive education provides the opportunity for children with typical and atypical developmental needs to learn together. Inclusive early childhood curricula and instructional strategies are emphasized as is the professional role of interdisciplinary team member. Legislative mandates for inclusion are studied. *(Fall)*

CHFD 6220. Family Theory and Research. (3) Prerequisite or corequisite: CHFD 6102. Study of family theories and research which employ the contextual framework of the family as a system and which explain family of origin, family functioning, family structure, and family process. Application of theory and research will include an understanding of the various levels of family functioning as a model for developing family support and intervention plans. *(Fall)*

CHFD 6230. Emerging Literacy and Mathematical Understanding. (3) Prerequisite or corequisite: CHFD 6102. Emergent development of literacy and mathematical understanding in the home and preschool settings from birth through kindergarten are explored. Language and cognitive development theories and research are linked to home and classroom experiences that enhance literacy and mathematical understanding through developmentally appropriate practices. *(Spring)*

CHFD 6240. Advanced Studies in Infant and Child Development. (3) Prerequisite: CHFD 6102. An advanced course to extend knowledge of infant and early years development of typically and atypically developing children. Developmental domains of infants and young children and their relationships within family and society will be emphasized. *(Fall)*

CHFD 6400. Internship in Child and Family Studies. (3) Prerequisite: completion of at least 24 hours of graduate program. Corequisite: CHFD 6600. An intensive, professional supervised internship in which

students demonstrate the ability to provide direct service, to apply research and theory in a field-based setting, and to assume leadership roles. A minimum of 200 clock hours is required. *(Spring)*

CHFD 6600. Seminar: Leadership in Education of Children and Families. (3) Prerequisite: completion of at least 24 hours of graduate program. Corequisite: CHFD 6400. A synthesizing course of study focusing on review, compilation, analysis, and evaluation of the literature, research, and experiences relevant to the student's specialty area. Students will demonstrate leadership by conducting a program evaluation, creating innovative solutions to challenges, and initiating and creating collaboration among persons and across agencies. *(Spring)*

CHFD 6900. Research in Child and Family Studies (Master's Project/Thesis). (3) Prerequisites: RSCH 6101; completion of at least 24 hours of graduate program. Design, implementation, presentation, and evaluation of an approved applied research project in student's specialty area. The applied project is of the student's own design under the supervision of an advisor and graduate committee. Graded Pass/No Credit only. *(Fall)*

Advanced Graduate Only
CHFD 7135. Readings in Learning and Development. (3) Examines research data about the development of human behavior interpreted in terms of multiple disciplines, including psychology, anthropology and ethnology. *(On demand)*

CURRICULUM and SUPERVISION

Educational Administration: Curriculum Leadership

Department of Educational Administration, Research and Technology

3123 Colvard Building
(704) 547-4717
http://www.uncc.edu/colleges/education/eart/

Degree

M.Ed.

Coordinator

Dr. J. Allen Queen

Graduate Faculty

Professors
Carl Ashbaugh
James Lyons
J. Allen Queen

The M.Ed. in Curriculum and Supervision is designed to prepare highly competent program leaders for the school systems of North Carolina. UNC Charlotte is particularly dedicated to serving the 23 school districts located in the Southwestern Piedmont area of the state. To achieve its objectives, the program is designed to attract high-quality students develop specific competencies to enable them to define, communicate, interpret, and assess teachers in the implementation of state and local curricula.

Program Objectives

The major educational objectives of the program are to develop instructional leaders who have advanced knowledge and skills in curriculum development and supervisory practices to assist the school system by:

1) Guiding principals and teachers in the interpretation of curriculum standards and specific competencies for instructional development.
2) Directing teachers in curriculum and instructional alignment to maximize success for the highest levels of student achievement possible.
3) Promoting the expectations that effective teachers are masters of their subject content, highly knowledgeable of human dynamics, directly responsive to individual differences in students and well accomplished in the art and science of pedagogy and student assessment.
4) Encouraging participants in the program to self-direct their personal and professional growth as educators by:
    a) Taking responsibility for their own learning;
    b) Initiating professional inquiry through conversations with colleagues;
    c) Critically reading the professional literature;
    d) Participating voluntarily in personal and professional development opportunities; and
    e) Setting high expectations for their professional performance;
5) Guiding participants to promote in teachers the skills to respond effectively to children's differences as influenced by development, exceptionalities, and diversity by
    a) Developing an advanced understanding of human development;
    b) Expecting and respecting differences among children that are influenced by development, exceptionalities, and diversity;
    c) Promoting understanding and respect for all members of the classroom community;
    d) Helping students, parents, and colleagues develop a global perspective; and
    e) Applying their knowledge at all levels of interaction with students: from modifying instruction for individuals to creating classroom environments where all students feel welcome and can be successful learners.
6) Demonstrating advanced knowledge of the content and pedagogy in curriculum and supervision
    a) Demonstrating advanced knowledge of the range of appropriate content;

b) Helping children to acquire the knowledge and skills appropriate for specific grade levels and development through many effective instructional and assessment practices;
c) Using technology in a variety of ways to support learning;
d) Helping students develop competencies applicable across the curriculum; and
e) Helping children make sense of their learning by connecting school content and students' lives outside of school and by integrating curriculum.

7) Improving educational practice through self-reflection, self-evaluation, and applied research by
   a) Engaging in study that leads to continuous improvement of teaching and learning;
   b) Actively investigating and solving educational problems through data gathering and assessment;
   c) Continuously monitoring the learning problems and successes of each learner;
   d) Making appropriate adjustments in both instruction and learning environments based on analysis of data; and
   e) Regularly monitoring the effects of their actions on academic achievement.
8) Serving as educational leaders by:
   a) Actively participating as leaders in areas in which they can contribute to solving educational problems, such as School Advisory Teams and committees in professional organizations;
   b) Taking responsibility for sharing in decision-making relative to school-wide and/or system-wide issues;
   c) Readily asking for and sharing successful instructional approaches and solutions with colleagues, supervisors, and educational leaders;
   d) Providing mentoring for colleagues

The Program

Today, curriculum specialist and instructional supervisors must be able to elicit support and create program structures and climates that foster the kinds of creativity, change and innovation that will educate the most diversified group of children ever in America's schools. To meet this challenge, the M.Ed. program focuses on curriculum development. It enables students to develop specific competencies related to curriculum leadership, instructional practice and supervisory roles. It emphasizes performance and competence in school-based leadership and the overall quality of K-12 instruction.

The M.Ed. program provides for 30 credit of classroom study followed by one semester of a full-time internship. In the cohort, a part-time student can complete the program in two years. Students average two courses per semester with the final nine credit hours of each semester is undertaken on a full-time basis. The program faculty will work with students and school districts to arrange for the internships to be completed with minimum impact on their current positions.

General Curriculum Plan

The 39 semester-hour M.Ed. program includes nine hours of professional education core courses, 30 hours of course work in curriculum an educational administration and leadership (including academic experience in internships and seminars).

Professional Education Core Courses (9)

EDUC 6100	Theories of Human Development and Learning
RSCH 6101	Educational Research Methods
ADMN 6100	Fundamentals of Educational Leadership

Core Courses in Educational Administration and Leadership (21)

CURR 6122	Curriculum Development
CURR 6162	Planning for K-12 Instruction
CURR 6356	Curriculum Studies
ADMN 6120	Instructional Leadership
ADMN 6121	Strategies and Designs in Curriculum
ADMN 6125	Advanced Instructional Techniques
ADMN 6130	Supervision of Instruction

Internship/Seminars (9)

ADMN 6601	Seminar in Supervision
ADMN 6491	Internship and Seminar: Supervision

Additional Admissions Requirements

In order to be considered for admission to the M.Ed. program, applicants are expected to submit the following materials to the Graduate Admissions Office:

1) A written application;
2) evidence of a bachelor's degree or its equivalent from an accredited institution with an overall GPA of a least 3.00;
3) Two official transcript of previous academic work attempted beyond high school;
4) A score of 50th percentile or higher on the Graduate Record Examination or the Miller Analogies Test taken within the previous five years;
5) Three professional recommendations;
6) A description of previous relevant employment, including evidence of at least three years of successful teaching experience in K-12;
7) Evidence of state licensure as a classroom teacher; and
8) A personal statement of purpose or intent for entering the program.

Applications to the program will be accepted in the spring for admission the following fall semester. The process is designed to ensure the selection of a highly competent and diverse cohort of students. The number admitted each year will be based on current resources, but it is expected to be approximately 20 full-time students admitted for the program. Upon successful completion of

the program and Praxis examination, graduates will receive licensure.

Courses in Curriculum and Supervision

CURR 6120. Curriculum Theory. (3) Study of theoretical constructs of curriculum and the nature of experience as they relate to facilitating theory into practice. Emphasis on research and experimentation in developing curriculum theory, processes, materials and relationships. *(Fall, Spring, Summer)*

CURR 6122. Curriculum Development. (3) Planning, development and evaluation of curricular programs. *(On demand)*

CURR 6150. Models of Teaching. (3) Prerequisites; EDUC 6100, RSCH 6101, and CURR 6120. Learning theory associated with information processing, personal, social, and behavioral models; current trends in instructional methodology for a variety of content areas. *(Spring)*

CURR 6161. Research and Analysis of Teaching. (3) Concepts, methods and practices used by effective teachers in daily classroom routines, including systematic observation and analysis of instructional activities, interpretation of data, and application of research findings. Field experiences required. *(Fall, Spring, Evenings)*

CURR 6162. Planning for K-12 Instruction. (3) Prerequisites: EDUC 6100 and 6102. Planning for classroom instruction and evaluation of learning. Emphasis on writing learning objectives and instructional plans for various domains of learning. Examination and development of assessment procedures for formative and summative evaluation of student learning. *(Fall, Spring, Evenings)*

CURR 6356. Curriculum Studies. (3) Examination of the field of curriculum study with particular emphasis on the change process.

EDUCATIONAL ADMINISTRATION

Educational Administration: Principalship

Department of Educational Administration, Research and Technology

3123 Colvard Building
(704) 547-4717

Degree

M.S.A.

Coordinator

Dr. Glenda Poole

Program of Study

The Master of School Administration (M.S.A). program is designed to prepare individuals who can serve as building principals and curriculum and instructional specialists in K-12 schools. This program qualifies graduates for both a Level I license as a K-12 School Administrator: Principal and a Level I license as a K-12 Curriculum Instructional Specialist: Supervisor.

Program Objectives

As prospective school principals, graduates of the program are prepared to: demonstrate an understanding of the purpose, mission, goals, objectives, and operating procedures of schools; plan educational programs and activities; acquire and manage resources for instruction in a school; assess educational programs and personnel; facilitate group cohesiveness, staff cooperation and motivation, problem solving, decision-making, and the resolution of organizational, group, and individual conflict; exercise collaborative leadership in working with diverse groups and representing staff, students, parents, school officials, and the public; improve staff members' work experiences, enhance their self-confidence, and contribute to their professional development; deal with the dynamics of change, including timing, direction, strategies, and preparation of an organization and its staff; and demonstrate an understanding of how legal, social, economic, technological, and political environments affect schools and the education of children.

Additional Admission Requirements

In addition to the general requirements for admission to the Graduate School, applicants must submit a personal statement of purpose, a description of previous relevant employment (including evidence of at least three years of successful teaching and,), evidence of leadership exercised while serving as a teacher), and recommendations from school administrators.

Admission decisions are based on a comparison of applicant profiles and are made by a program admissions committee that includes program faculty, the chair of the department, and one or more of the program's clinical instructors. Applicants with the highest profile rankings are invited to participate in interviews that are conducted by program faculty and designed to provide evidence of an applicant's academic strength, leadership potential, and personal characteristics. Admission decisions are based not only on the comparative profiles of all applicants, but also on the commitment of program faculty to achieve diversity among the students admitted in each year's cohort group. Admission decisions are made in the spring, with the expectation that admitted students will begin their course work the following fall.

Degree Requirements

The M.S.A. program requires a total of 48 hours of core courses, educational administration courses, and cognate courses outside the College of Education:

Core Courses (6 hours)

RSCH 6101 Educational Research Methods (3)
EDUC 6102 Person in School and Urban Society (3)
or
EDUC 6100 Theories of Human Development and Learning (3)

Educational Administration Courses (36 hours)

ADMN 6100 Fundamentals of Educational Leadership (3)
ADMN 6105 Legal Aspects of Schooling (3)
ADMN 6110 School Leadership and Management (3)
ADMN 6120 Instructional Leadership (3)
ADMN 6130 Supervision of Instruction (3)
ADMN 6140 Curriculum Leadership (3)
ADMN 6410 Internship and Seminar Part I (9)
ADMN 6420 Internship and Seminar Part 11 (9)

Cognate Courses (6 hours)

These courses must be approved by the student's advisor.

Capstone Experiences

Students must complete both a comprehensive examination and a major project. On the examination, students must demonstrate that they have developed a thorough and well-integrated understanding of both the basic principles, research findings, and theories covered in their course work and specific strategies for applying these principles, findings, and theories to educational practice and leadership at the school level. The culminating project grows out of the student's internship and is collaboratively planned by the student, program faculty, and the building principal who supervised the student's internship. The student must prepare a detailed written description of the project and defend it orally before a faculty committee and fellow interns in the program.

Principal Fellows

Each year a limited number of scholarship/loans for persons seeking an M.S.A. as full-time students are available from the North Carolina Principal Fellows Program. Funded by the North Carolina General Assembly to help highly qualified persons study school administration on a full-time basis, the program provides $40,000 over a two-year period and requires repayment with either four years of service as a school administrator in a North Carolina public school or monetary reimbursement of the original loan, plus interest.

In the spring of each year, the North Carolina Principal Fellows Commission selects new Principal Fellows from applications received prior to March 1. To be eligible for consideration, an applicant must provide evidence of at least three years of successful teaching experience (or equivalent experience), at least a 3.2 grade point average in his or her last 60 hours of college-level study, and unconditional admission as a full-time student in one of the state's M.S.A. programs. Additional admission criteria and procedures are described in an application packet that can be obtained from the North Carolina Principal Fellows Program. Current information about the program is available in the department office.

EDUCATIONAL ADMINISTRATION

Advanced Educational Leadership

Department of Educational Administration, Research, and Technology

3123 Colvard Building
(704) 547-4717

Degree

Ed.D.

Coordinator

Dr. Jane Testerman

Program of Study

The Ed.D. program in Educational Leadership is designed to prepare educational administrators who can assume mid-level and senior-level leadership positions in precollegiate educational settings, particularly in the public school systems of North Carolina.

The program requires 60 hours beyond the master's degree and builds on the Master of School Administration (M.S.A.) and comparable programs.

Although the maximum amount of credit past the Master's of School Administration (M.S.A.) degree that an Ed.D. student may count towards a doctorate is 9 semester hours, only **educational administration courses approved by the program coordinator may be transferred.** This rule applies whether the courses were taken at UNC Charlotte or elsewhere; however, no more than six hours taken when the student was in post-baccalaureate (non-degree seeking) status may be applied toward the doctoral degree.

Time Limit

Candidates must complete all course work for the degree, including accepted transferred credit, within eight years from the time they first register as doctoral students. Courses that exceed this time limit must be revalidated or retaken, whichever the graduate program decides is necessary, if they are to be included in the degree program.

To revalidate a course, the student, along with the program coordinator, must prepare a revalidation plan

which must be reviewed and approved by the Dean of the Graduate School. This plan often involves taking a special examination designed by the faculty of the graduate program. Once the plan has been completed, the program coordinator must notify the Dean of the Graduate School in writing.

Students may not revalidate a course with a grade of C or lower, courses that are internships or other forms of practica, or courses taken at other institutions.

Program Objectives

As prospective superintendents and other mid-and senior-level school administrators, graduates of the program are prepared to: exhibit a broad and systematic understanding of professional education; demonstrate leadership competencies and skills necessary to accomplish the goals of complex organizations; interact successfully with the numerous institutions and interests that influence education and the complex milieu in which schools operate; administer high-quality programs in schools and school districts; understand theoretical concepts that undergird organizational theory and behavior, leadership, social psychology, policy development, and organizational change; address basic issues that face educational leaders, including resource acquisition and management, policy development and analysis, program management, policy development and analysis, program development and evaluation, staff selection and appraisal, school-community relations, and curriculum development and school community relations, and curriculum development and instruction; conduct research on problems and needs facing school today and apply research findings in an informed and critical manner and understand, appreciate, and behave consistently with ethical codes of conduct that are relevant to educational leaders in today's elementary, middle, and secondary schools.

Additional Admission Requirements

In addition to the general requirements for admission to the Graduate School, applicants must have a master's degree in school administration, educational administration, or a closely related field; an entry-level license in educational administration or supervision; and a minimum of three years of successful administrative experience, which may include the full-time internship required for the MSA degree. Applicants must also submit a personal essay of purpose; a description of their previous relevant employment, including especially their administrative experience in schools; and recommendations from school administrators and former university instructors.

Admission decisions are based on a comparison on of applicant profiles and are made by a departmental admissions committee that includes program faculty. Applicants with the highest profile rankings are invited to participate in interviews that are conducted by the Ed.D. Admissions Committee is designed to provide evidence of an applicant's academic strength, leadership potential, and personal characteristics. Admission decisions are based not only on the comparative profiles of all applicants, but also on the commitment of the Admissions Committee to achieve diversity among the students admitted in each year's cohort group. Admission decisions are made in the spring, with the expectation that admitted students will begin their course work the following fall.

Degree Requirements

The Ed.D. program in Educational Leadership requires a total of 60 hours of educational administration courses, research courses, and cognate courses outside the College of Education. Students must also complete a residency of at least 18 credit hours over three successive terms of enrollment, a doctoral comprehensive examination, a yearlong administrative internship in a K-12 school district, and a doctoral dissertation research study.

Educational Administration Courses (30 hours)

ADMN 8110	Organizational Theory and Behavior (3)
ADMN 8120	Advanced School Law (3)
ADMN 8130	Educational Governance and Policy Studies (3)
ADMN 8140	School Finance (3)
ADMN 8150	Human Resources Development & Administration (3)
ADMN 8410	Advanced Internship in Educational Leadership Part I (3)
ADMN 8420	Advanced Internship in Educational Leadership Part 11 (3)
ADMN 8610	Interdisciplinary Seminar (1) (3 hours required)
ADMN 8660	Instructional Leadership Seminar (3)
CURR 8122	Advanced Curriculum Theory (3)

Research Courses (18 hours)

RSCH 8210	Applied Educational Research (3)
RSCH 8110	Descriptive & Inferential Statistics (3)
RSCH 8120	Advanced Educational Statistics (3)
ADMN 8699	Dissertation Research Seminar (3)
ADMN 8999	Dissertation Research (3) (6 hours required)

Cognate Courses (12 hours)

These courses must be outside the College of Education and approved by the student's advisor.

Admission to Candidacy Requirements

Students are recommended for admission to candidacy after successfully completing the written and oral comprehensive examination.

Internships

All students are required to complete a year-long administrative internship in a K-12 school district. The internship is based upon identified objectives and organizational areas within the school system of the internship assignment. Students are also required to

complete a project based upon a current administrative topic and an electronic portfolio.

Waived Credit

A maximum of 15 hours of graduate credit may be waived for students who possess an Educational Specialist (Ed. S.) degree. No more than nine hours can be considered in each of the following areas: administration, research, and cognates The student's advisor, doctoral coordinator, and departmental chairman must approve all credit considerations.

Licensure

Upon successful completion of all course work, except the internship and dissertation, and a qualifying written and oral examination, Ed.D. students receive a Certificate of Advanced Study (C.A.S.) in educational administration, which qualifies them for North Carolina licensure as school superintendents. Upon completion of all requirements for the Ed.D. in Educational Leadership, students are qualified for the Level III (doctorate) School Administrator license in North Carolina.

Comprehensive Examination

Students are required to successfully pass a written and oral examination. The examination is based upon the core areas of educational leadership, educational research, and a student's cognate studies.

Dissertation

Students must complete and defend a dissertation focused on a specific problem or question relevant to K-12 educational organizations, administration, or leadership. Students must be continually enrolled for dissertation research credit, beginning with the semester following completion of the comprehensive examination and continuing through the semester of their graduation. Their enrollment for dissertation research credit must total at least 6 hours. Defense of their dissertation is conducted in a final oral examination that is open to members of the University community.

Application for Degree

Students may submit an Application for Degree during the semester in which they successfully defend their dissertation proposal. Adherence to Graduate School deadlines is expected. Degree requirements are completed when students successfully defend their dissertation and file the final copy of the dissertation in the Graduate School.

Courses in Educational Administration

ADMN 6000. Topics in Educational Administration. (1-6) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

ADMN 6100. Fundamentals of Educational Leadership. (3) The developing role of educational organizations in the United States and the societal and cultural influences that affect the delivery of schooling. Structure and organization of American schools, administrative and organizational theory, legal, moral, and ethical dimensions of schooling within the context of restructuring and reform. *(Fall)*

ADMN 6105. Legal Aspects of Schooling. (3) Education law for education professionals which focuses on the legal rights and responsibilities of students, teachers, and administrators and how these legal provisions affect educational policy and practice. *(Fall, Spring)*

ADMN 6106. Legal Issues in Special Education. (3) Survey of federal and state statutory and administrative provisions governing the delivery of education and related services to exceptional students. *(On demand)*

ADMN 6107. School Law for Counselors and Related Professionals. (3) Legal issues and problems of special relevance to school counselors, psychologists, social workers, and related professionals who work with school-age children. *(On demand)*

ADMN 6110. School Leadership and Management. (3) Examination of school leadership and administration, focusing on the role, tasks, and responsibilities that accompany school-based leadership. *(Summer)*

ADMN 6120. Instructional Leadership. (3) Examination of research-based teaching/learning models and the relationship between instructional decisions and curriculum experiences. Dynamics of group development and problems/practices related to providing instructional assistance to teachers. *(Summer)*

ADMN 6121. Strategies and Designs in Curriculum Development. (3) Examination of principles and practices for educational leaders in program design, implementation and evaluation. *(On demand)*

ADMN 6125. Advanced Instructional Techniques. (3) Analysis of models of teaching and the match between attributes of the models and the instructional outcomes desired by the teacher. *(On demand)*

ADMN 6130. Supervision of Instruction. (3) Corequisite: ADMN 6410. Introduction to clinical supervision and development of skills in classroom observation, analysis, evaluation, and assistance. Systems of observation, principles of adult development in school settings, techniques for conducting classroom observations and conferences, and development of staff

development programs to remedy assessed weaknesses. *(Fall)*

ADMN 6140. Curriculum Leadership. (3) Corequisite: ADMN 6420. Examination of internal and external influences on curriculum formation and development at the building level with emphasis on development of administrative strategies for curriculum decision-making which are driven by staff involvement. *(Spring)*

ADMN 6160. Introduction to Educational Administration. (3) Examination of behavioral components of administrative theory, organization, decision-making and planning for educational development including appraisal of significant functions, techniques, practices and problems as they relate to public school systems, social institutions, and the system of social and governmental agencies. *(On demand)*

ADMN 6161. The Principalship. (3) Examination of school administration focusing on the role, task and responsibilities associated with the principalship with special attention to the conceptual, human and technical skills associated with the principal. *(On demand)*

ADMN 6166. Educational Leadership. (3) Examination of leadership in formal organizations and social and behavioral science research concerning leadership ability with emphasis on educational organizations and the role of the leader in the accomplishment of organizational goals. *(On demand)*

ADMN 6410. Internship and Seminar Part I. (3, 9) Corequisite: ADMN 6130. Full-time academic year internship in educational administration designed to allow theoretical and course-based practical learning to be translated and interwoven into a supervised field-based experience. *(Fall)*

ADMN 6420. Internship and Seminar Part II. (3, 9) Corequisite: ADMN 6140. A continuation of the internship experiences and seminar begun in ADMN 6410. *(Spring)*

ADMN 6490. Internship and Seminar: Administration. (3-6) Prerequisite: Department approval. Internship under the supervision of University and on-site personnel in a setting consistent with the student's professional goals in which the student will be involved in the diverse activities expected of the professional administrator. Seminars are held concurrently. *(On demand)*

ADMN 6491. Internship and Seminar: Supervision. (3-6) Prerequisite: Permission of the department. Internship under the supervision of University and on-site personnel in a setting consistent with the student's professional goals in which the student will be involved in the diverse activities expected of the curriculum-instructional specialist. Seminars are held concurrently. *(On demand)*

ADMN 6601. Seminar in Administration and Supervision. (1-3) Prerequisite: Permission of the department. Examination of selected areas of interest in educational administration and supervision. May be repeated for credit with departmental approval. *(On demand)*

ADMN 6800. Individual Study in Educational Administration. (1-6) Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

ADMN 7190. Public School Administration. (3) Examination of theory and practice of public school administration including the roles of school boards, superintendents, central office administrators and other members of the leadership team at the district-wide level with emphasis on the role of the superintendent. *(On demand)*

ADMN 7194. Planning School Facilities. (3) Examination of practices, principles and procedures related to educational facility planning including an overview of the major steps involved in planning educational facilities and the roles of all participants in a building program with special emphasis on the roles of the superintendent and board of education. *(On demand)*

ADMN 7250. Educational Policy Studies: Trends, Issues, and Problems. (3) Examination of educational issues, trends, problems, proposals, policies, and practices within historical, social, economic, political, and philosophical contexts. *(On demand)*

ADMN 7489. Practicum in Staff Development. (3) Examination of techniques of delivering in-service training and development of leadership for in-service educational programs including design and implementation of a staff development program in a school setting. *(On demand)*

ADMN 7490. Culminating Experience: Administration. (3-6) Demonstration of appropriate leadership abilities in a field setting. Required for school administrators. May be repeated for credit. *(On demand)*

ADMN 7491. Culminating Experience: Supervision. (3-6) Demonstration of appropriate leadership skills in a field setting. Required for curriculum and instruction specialists. May be repeated for credit. *(On demand)*

ADMN 7601. Seminar in Administration and Supervision. (1-3) Prerequisite: Permission of the department. Examination of selected areas of educational administration and supervision. May be repeated for credit with departmental approval. *(On demand)*

ADMN 7695. Advanced Seminar in Teaching and Learning. (3) Examination of a number of current teaching models to provide a framework for choosing those appropriate for a given classroom setting with special attention to the relationship between teaching strategies and learning outcomes. *(On demand)*

ADMN 7800. Individual Study in Educational Administration. (1-6) Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

ADMN 7999. Graduate Residence. (0) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring)*

Advanced Graduate Only

ADMN 8110. Organizational Theory and Behavior. (3) Prerequisite: Admission to Ed.D. program in Educational Leadership. Analysis of the structure and organization of public education in the United States in terms of organizational theory and historical development. Consideration of organizational change theory, organizational development, and the planning process. *(Fall)*

ADMN 8120. Advanced School Law. (3) Prerequisite: ADMN 6105 or 6107 or permission of the instructor. Current policy issues, including educational finance, testing/grouping, desegregation/integration, and the provision of public educational services to private-school students. *(Spring)*

ADMN 8130. Educational Governance and Policy Studies. (3) Prerequisite: Admission to Ed.D. program in Educational Leadership. An examination of the institutional structure for policy-making in American education and the theories, models and practices that relate to policy-making in education. *(Summer)*

ADMN 8140. School Finance. (3) Prerequisite: Admission to Ed.D. program in Educational Leadership or permission of instructor. An examination of the theory and operation of public school finance systems and school business administration with special attention to local, state, and federal sources of revenue and such business functions as budgeting and financing capital outlay projects. *(Fall)*

ADMN 8150. Human Resources Development and Administration. (3) Prerequisite: ADMN 8110 or initial licensure as school administrator. Examination of personnel administration in educational institutions, including administration of personnel at the school district level and its contribution to the overall management and operation of a school system. *(Summer)*

ADMN 8410. Advanced Internship in Educational Leadership Part I. (3) Prerequisites: ADMN 8110, 7120, 7130, and 7140. Internship experiences planned and guided cooperatively by University and school personnel, including some work in private, community, or social service organizations. Accompanying cohort seminar for integrating and synthesizing knowledge and skills useful to practicing school leaders. *(Fall)*

ADMN 8420. Advanced Internship in Educational Leadership Part II. (3) Prerequisite: ADMN 8410. Continuation of ADMN 8410. *(Spring)*

ADMN 8610. Interdisciplinary Seminar. (1) Prerequisite: Admission to Ed.D. program in Educational Leadership. Corequisite: Simultaneous enrollment in one or more courses in the Ed.D. program. Ideas, values, cultures, and contemporary issues affecting society generally and education particularly and principles and practices for responding to the publics with whom school leaders interact. May be repeated for credit. *(Fall, Spring)*

ADMN 8660. Instructional Leadership Seminar. (3) Prerequisite: EDUC 8122. Investigation and evaluation of current trends and issues in supervision as they relate to the role of the educational leader, with special attention to the role of facilitating the teaching/learning process. *(Summer)*

ADMN 8699. Dissertation Proposal Seminar. (3) Prerequisite: Completion of research requirements. Identification and definition of a research area and development of a proposal draft for an original research study appropriate for the dissertation requirement. *(Fall)*

ADMN 8999. Dissertation Research. (3) Prerequisite: Consent of Ed.D. program coordinator. Execution of original research study that addresses the solution to an educational or school-related problem or that addresses a substantive educational leadership or programmatic issue. *(Fall, Spring, Summer)*

CURR 8122. Advanced Curriculum Theory. (3) An examination of philosophic thought and its relationship to educational theories which have led to assumptions for educational practices in American schools. *(On demand)*

ELEMENTARY EDUCATION

Degree
M.Ed.

Department of Reading and Elementary Education
5062 Colvard Building
(704) 547-4500

Coordinator
Dr. Jack Piel

The Program
The master's (M.Ed.) program in Elementary Education is a K-6 instructional degree that leads to the "M" level teaching license. This 39-hour program promotes the following strands of competence:

1) Instructional Leader and Mentor
This degree program enables graduates to develop leadership/mentorship skills as well as qualify for a $1,000 statewide mentorship stipend

2) Career Path for Teachers as Educational Leaders
Learn "best practices" for instructional tactics based on current research findings in education. Completion of this degree program will enable graduates to advance up the pay scale through a 10% salary increase.

3) National Board Certification Alignment
Completion of this program will assist graduates in the pursuit of National Board Certification, which entitles them to an additional 12% salary increase.

Program Goals
Master teachers are self-directed in their personal and professional growth as educators.
Master teachers are responsive to children's differences influenced by development, exceptionalities, and diversity.
Master teachers are well-grounded in the content and pedagogy of the entire elementary curriculum.
Master teachers are elf-reflective, self-evaluative, and educational researchers.
Master teachers are collaborative educational leaders.

Instructional Phases
This degree program is organized so that students will become instructional leaders through:

1) Phase I Developing Perspectives
Thirteen (13) hours of Professional, Theoretical, and Research coursework applicable to elementary education. This coursework establishes the basis for Phase II and Phase III.

2) Phase II Content and Pedagogy
Sixteen (16) hours of coursework based on current research findings. Graduates will investigate and share effective instructional practices designed to improve learning in the classroom.

3) Phase III Collaborative Leadership
Four (4) hour block of coursework developed to help students achieve the necessary skills to become instructional leaders and mentors within a public school setting.

Electives
Six (6) hour requirement selected from a variety of course offerings designed to allow teacher leaders to guide their own learning relative to goals and interests

Phase I. Developing Perspectives
Complete Phase I core requirements according to approved plan before beginning Phase II. Note Prerequisite for ELED 6220 (ELED 6101).

Requirements (13 hours)

ELED 6101	Applications of Theories of Human Development and Learning (3)
RSCH 6101	Educational Research Methods (3)
ELED 6111	Critical Issues in Elementary Education (3)
ELED 6220	Integrating the Elementary Program (3)
ELED 6691A	Seminar in Professional and Leadership Development (1)

Phase II: Content and Pedagogy
Complete requirements of Phase II according to your approved plan before Phase III.

Requirements (16 hours)

EDUC 6254	Individualizing Instruction for Diverse Learners (3)
ELED 6221	Teaching and Learning K-6 Science (3)
ELED 6241	Teaching and Learning K-6 Social Studies (3)
ELED 6252	Teaching and Learning K-6 Mathematics (3)
READ 6250	Language Development and Reading (3)
ELED 6691B	Seminar in Professional and Leadership Development (1)

COURSES IN ELEMENTARY EDUCATION

ELED 6000. Topics in Elementary Education. (1-6) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

ELED 6101. Applications of Theories of Human Development and Learning. (3) Review of paradigms of human development theory as a basis for identifying

and clarifying teachers' beliefs about development and learning. Analysis and subsequent improvement of alignment of teachers' instructional practices to their chosen theoretical paradigms.*(Fall, Spring)*

ELED 6111. Critical Issues in Elementary Education. (3) Three categories of instructor-and student-selected issues: government, governance, and the elementary schools; changing educational roles of professional educators, parents, and children; and the evolving missions of elementary schools. Focus on the self as learner and the re-examination of one's beliefs, teaching practices, and learning in multiple contexts.*(Fall) (Summer)*

ELED 6220. Integrating the Elementary Program. (3) Prerequisite: ELED 6101. Theoretical and historical roots of the integrated curriculum, factors which have supported or constrained implementation of this model, and methods for meaningful curriculum integration across subject areas and home/school cultures.*(Spring) (Summer)*

ELED 6221. Teaching and Learning K-6 Science. (3) Prerequisites: Completion of Phase One. Critical reading and use of the literature in science education, examination of science content taught in the elementary school, multiple models and approaches for teaching and assessing learning in science, required action research project. *(Fall)*

ELED 6241. Teaching and Learning K-6 Social Studies. (3) Prerequisites: Completion of Phase One. Critical reading and use of the literature in social studies education, examination of social studies content taught in the elementary school, multiple models and approaches for teaching and assessing learning in social studies, required action research project.*(Spring)*

ELED 6251. Teaching and Learning Mathematics. (3) Prerequisite: core requirements. Examination of the K-6 mathematics curriculum, including a critical analysis of research literature related to problem solving processes and mathematics learning. *(Yearly) (Evenings)*

ELED 6252. Teaching and Learning K-6 Mathematics. (3) Prerequisite: Completion of Phase One. Critical reading and use of the literature in mathematics education, examination of mathematics content taught in the elementary school, multiple models and approaches for teaching and assessing learning in mathematics, required action research project. *(Fall, Spring)*

ELED 6470. Elementary Education Clinical Experience. (3-6) Prerequisite: Department approval. Program of experiential learning activities in an approved school setting (K-6). Departmental approval required.*(On demand)*

ELED 6474. Advanced Practicum in Teaching, Learning, and Leadership. (3) Prerequisites: Completion of Phase I and II courses and permission of the department. Advanced study, consideration, selected application, and evaluation of principles and practices which master teachers use to mentor the professional development of peers, collaborate with others, influence educational practices beyond their own classrooms, and support elementary students' development of competence and responsibility for their own learning and behavior. *(Fall, Spring)*

ELED 6691. Seminar in Professional and Leadership Development.
(1) Seminar focused on the self-direction and collaboration of teachers as they design, develop, and present their individual program plans, their basic program portfolio, and their capstone experience of the Master's Research Project or Comprehensive Portfolio. (Must be repeated once per program phase, for a total of 3 credit hours.) *(Spring)*

ELED 6800. Individual Study in Elementary Education. (1-6) Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

ELED 7999. Graduate Residence. (0) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring)*

INSTRUCTIONAL SYSTEMS TECHNOLOGY

Department of Educational Administration, Research, and Technology

3123 Colvard Building(704) 547-4717
http://education.uncc.edu/ist

Degree

M.Ed.

Coordinator

Dr. John Gretes

Graduate Faculty

Marty Bray, Assistant Professor
John A. Gretes, Professor

Designed for both teachers in public and private schools and persons in the private sector who wish to increase their instructional technology skills and who seek to develop skills for designing and implementing curriculum and instructional strategies that incorporate instructional

systems technology. The M.Ed. Program in Instructional Systems Technology qualifies graduates who already hold either an "A" or "G" level teaching license from the North Carolina Department of Public Instruction (or from another state) for the new Masters/Advanced Competencies "M" license in Instructional Technology Specialists: Computers.

Program Objectives

Aligned with the *1997 North Carolina Excellent Schools Act* and the propositions of the National Board for Professional Teaching Standards, the program prepares graduates to:

1) integrate appropriate technology into learning systems;
2) undertake instructional analyses that include task analysis,
3) audience analysis, instructional environment analysis, and both target enabling objectives and measures;
4) identify criteria, strategies, services, and information sources for hardware and courseware evaluation, selection, and integration;
5) plan, develop, revise, and evaluate courseware using a standard planning process and accepted standards and criteria;
6) evaluate instructional technology systems;
7) work effectively as members of a design and development team that generates solutions to instructional problems; and
8) provide leadership in the field of instructional systems technology systems.

Additional Admission Requirements

In addition to the general requirements for admission to the Graduate School, applicants seeking the new Master's/Advanced Competencies "M" license in Instructional Technology Specialist: Computers must already hold either an "A" or "G" level teaching license from the North Carolina Department of Public Instruction (or its equivalent from another state).

Given the nature and size of the graduate degree program, applicants are only admitted for the Fall of each year. Each entering group of students will be provided a sequence of course offerings for the program. This allows students to know when the courses they will need are offered. Please contact the Graduate School for application deadlines.

Degree Requirements

The M.Ed. Program in Instructional Systems Technology requires a total of 39 hours of courses of foundations courses (18 hours), instructional development courses (6 hours), internship and seminar (6 hours), plus related coursework (9 hours). Students must also complete the "Capstone" experience described below.

Foundations I (9 hours)

EDUC 6100	Theories of Human Development and Learning (3)
RSCH 6101	Educational Research and Evaluation (3)
EIST 6100	Readings in IST (3)

Foundations II (9 hours)

EIST 6110	Instructional Design (3)
EIST 6135	Learning, Media, Resources and Technology (3)
EIST 6121	Instructional Courseware Authoring (3)

Instructional Development (6 hours)

EIST 6130	Instructional Development Part I (3)
EIST 6140	Instructional Development Part II (3)

Internship Seminar (6 hours)

EIST 6491	Internship and Seminar IST Part I (3)
EIST 6492	Internship and Seminar IST Part II (3)

Related Coursework (9 hours)

Courses may be selected from the following categories and must be approved by the student's advisor: educational research and evaluation, MIS, technical writing, curriculum and instruction, computer systems and networking, *administration and supervision courses.

*For the Instructional Technology Specialist: Computers "M" license the following courses must be completed as a part of the related coursework for the degree:

ADMN 6120	Instructional Leadership (3)
ADMN 6130	Supervision of Instruction (3)

A third 3-hour course may be selected by the student and the advisor (see categories listed above for suggested coursework)

Capstone Experience

Students must complete a master's project. The project may take the form of a thesis, research study, or program development activity. The project is followed by an oral examination in which the student clarifies, expands, and defends his or her master's project.

Courses in Instructional Systems Technology

EIST 5100. Computer Applications in Education (3) Computer systems and software for enhancing teaching, learning, and educational management; evaluating, selecting, and integrating courseware; focus on current PC operating system, word processing, database, spreadsheet, presentation, Internet, e-mail, and multimedia software. *(Fall, Spring, Summer)*

EIST 6000. Topics in Instructional Systems Technology. (1-6) May include classroom and/or clinic experiences in the content area. With department

approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

EIST 6100. Reading in Instructional Systems Technology. (3) Contemporary issues and trends in instructional systems technology, including foundations in learning research, instructional systems design, requirements for instruction, task and needs analysis, learning situations and instructional models, learner characteristics, hardware and software innovations, assessing instructional outcomes, and factors affecting utilization. *(Fall)*

EIST 6110. Instructional Design. (3) Prerequisites: EDUC 6100 and RSCH 6101. Advanced instructional design; systems development; task analysis; sequencing and delivery systems. *(Spring)*

EIST 6121. Instructional Courseware Authoring. (3) Planning and developing instructional computer courseware using an authoring system to produce courseware that has application in the learning environment. *(Fall)*

EIST 6130. Instructional Development Part I. (3) An introduction to the instructional development process using design team roles of instructional designer, evaluator, technical writer, media support person, and project manager; students develop an instructional materials package (module) to meet a simulated need. *(Fall)*

EIST 6135. Learning Media, Resources and Technology. (3) Selection, use and evaluation of technological innovations in instructional media. *(Spring)*

EIST 6140. Instructional Development Part II. (3) Prerequisite: EIST 6130. Practical application of the instructional development process using design team roles of instructional designer, evaluator, technical writer, media support person, and project manager; students develop an instructional materials package (module) to meet a real need. *(Spring)*

EIST 6491. Internship and Seminar in Instructional Systems Technology Part I. (3) Application of knowledge and skill in instructional systems technology in a cooperating setting on or off campus; also includes a seminar. *(Spring)*

EIST 6492. Internship and Seminar in Instructional Systems Technology Part II. (3) Prerequisite: EIST 6491. Continued application of knowledge and skills in instructional systems technology in a cooperating setting on or off campus; also includes a seminar. *(Fall, Summer)*

EIST 6800. Individual Study in Instructional Systems Technology. (1-6) Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

EIST 7999. Graduate Residence. (0) Meet Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring, Summer)*

MIDDLE GRADES EDUCATION and SECONDARY EDUCATION

Department of Middle Grades, Secondary, and K-12 Education

5007 Colvard Building
(704) 547-4521
http://education.uncc.edu/mdsk/

Degree

M.Ed.

Coordinator

Dr. Jeanneine P. Jones

Graduate Faculty

Lilian Brannon, Professor
Bill Britt, Professor
Warren DiBiase, Assistant Professor
Jeanneine P. Jones, Associate Professor
Caroline Linse, Assistant Professor
Corey Lock, Professor
Theresa Perez, Professor
David Pugalee, Assistant Professor
Eugene Schaffer, Professor

Program of Study

The Master of Education in Middle and Secondary Grades Program has been developed specifically for experienced practicing teachers in middle and secondary schools who are seeking an integrated, interdisciplinary experience in which their field specialization is programmatically interwoven with their professional courses. Because this degree focuses on a teacher's professional growth, it requires a portfolio in which students make connections among their courses and with their experiences in the classroom. As part of their professional growth and development, for example, students are required to take coursework in teacher leadership and conduct classroom research projects that explore theoretical knowledge into practice. By admitting only experienced teachers in a cohort group, students will

serve as resources for one another and become a professional community of committed, knowledgeable educators.

Admission Requirements
1) A Bachelor's degree from an accredited institution
2) A North Carolina "A" license in Middle Grades or Secondary Education, or the equivalent from another state
3) Two years full-time teaching experience in a middle grades or secondary classroom
4) An undergraduate GPA of 2.75 overall and 3.0 in the junior/senior years
5) An acceptable score on the GRE or MAT
6) A satisfactory essay providing a statement of purpose for Master's degree study
7) Satisfactory recommendations from three professional educators

Degree Requirements
Students select a track within the degree and therefore focus on either middle grades or secondary education. Each track requires a total of 39 hours of coursework.

Assistantships
There are opportunities available within the department. Contact the department for more information.

Internships
Each track requires an internship and seminar.

Core courses
There are three common core courses required within this degree. These include:

RSCH 6101	Educational Research Methods
CURR 6356	Curriculum Studies
CURR 6150	Models of Teaching

Electives
Each track provides for one three-hour elective.

Tracks
There are two tracks within this degree. One focuses on middle grades education and the other on secondary education.

Advising
Each student will have an assigned advisor within the department.

Licensure
Graduates will receive an Advanced Competency "M" license from the state of North Carolina.

Qualifying Examination
Acceptable scores on either the GRE or MAT.

Committees
Students will convene a committee of three graduate faculty members selected in conjunction with advisors. The primary role of this committee is to assess the students' culminating portfolio.

Research Opportunities/Experiences
Opportunities are available with department faculty members

Program Certifications/Accreditation
Programs are accredited by both NCATE and NCDPI.

MIDDLE GRADES EDUCATION

Degree Requirements
Total of 39 hours

RSCH 6101	Educational Research Methods (3)
CURR 6356	Curriculum Studies (3)
MDSK 6220	Adolescence and Learning (3)
CURR 6150	Models of Teaching (3)
MDLG 6225	Issues in Middle Grades (3)
MDSK 6260	Teacher Leadership (3)
MDLG 6473	Middle Grades Internship and Seminar (3)
Methods Course: choose content concentration (3)	
MDSK 6351	Advanced Methods in Middle and Secondary Science (3)
MDSK 6352	Advanced Methods in Middle and Secondary Mathematics (3)
MDSK 6353	Advanced Methods in Middle and Secondary English (3)
MDSK 6354	Advanced Methods in Middle and Secondary Social Studies (3)

Content Specialization Requirements (12 hours)
The content field of study may be chosen from one of the following areas:
- Science
- Social Studies
- Mathematics
- English

Professional Elective (3 hours)
Graduate-level electives should be chosen in consultation with student's advisor. Appropriate electives are offered by other departments. Possible elective options include the following:

EIST 6110	Instructional Design (3)
RSCH 6109	Assessment and Evaluation Methods (3)
RSCH 6110	Descriptive and Inferential Statistics in Education (3)
TESL 5101	Second Language Diagnosis and Evaluation (3)

TESL 5103	Teaching English as a Second Language (3)
EDUC 7126	Comparative Education (3)

SECONDARY EDUCATION

Degree Requirements *

Total of 39 hours

RSCH 6101	Educational Research Methods (3)
CURR 6150	Models of Teaching (3)
	Methods Course: choose content concentration (3)
MDSK 6351	Advanced Methods in Middle and Secondary Science (3)
MDSK 6354	Advanced Methods in Middle and Secondary Social Studies (3)
MDSK 6260	Teacher Leadership (3)
SECD 6475	Secondary Internship and Seminar (3)

Content Specialization Requirements (18 hours)
The content field of study may be chosen from the following areas:

Science
Social Studies

Professional Elective (3 hours)
* English and Mathematics programs offer advanced masters degrees in teaching. The requirements of these degrees differ from the M. Ed

Graduate-level electives should be chosen in consultation with student's advisor. Appropriate electives are offered by other departments. Possible elective options include the following:

EDUC 6102	Person and School in Urban Society (3)
EIST 4100	Computer Applications in Education (3)
EIST 6110	Instructional Design (3)
RSCH 6109	Assessment and Evaluation Methods (3)
RSCH 6110	Descriptive and Inferential Statistics in Education (3)
TESL 5101	Second Language Diagnosis and Evaluation (3)
TESL 5103	Teaching English as a Second Language (3)
EDUC 7126	Comparative Education (3)
CURR 6251	Issues in Science Education
CURR 6252	Issues in English Education
CURR 6253	Issues in Math Education
CURR 6254	Issues in Social Studies Education

COURSES IN MIDDLE GRADES EDUCATION

Middle Grades Education:

MDLG 5000. Topics in Middle Grades Education. (1-6) May include classroom and/or clinical experiences in the content area. With department approval, may be repeated for credit for different topics. (Fall, Spring, Summer)

MDLG 6000. Topics in Middle Grades Education. (1-6) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

MDLG 6225. Issues in Middle Grades Education. (3) Examination of educational practice in the middle grades (6-9) including trends and issues unique to the middle grades. Emphasis on broadening understanding of foundational components, organizational patterns, instructional programs and management techniques. *(Spring) (Evening)*

MDLG 6471. Middle Grades Education Clinical Experience. (3) Program of learning activities in the student's level and/or area of academic concentration in an approved school setting (6-9). *(On demand)*

MDLG 6473. Middle Grades Internship and Seminar. (3-6) Supervised clinical activities to develop and assess the student's ability to observe, analyze and recommend changes for curriculum and instruction in the middle grades classroom. *(Fall, Spring)*

MDLG 6800. Individual Study in Middle Grades Education. (1-6) Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

Advanced Graduate Only
MDLG 7999. Graduate Residence. (0) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring)*

Middle, Secondary, And K-12 Education:

MDSK 6220. Adolescence and Learning. (3) Study of adolescence as a phase of development and its relationship to the learning process. *(Fall)*

MDSK 6250. Issues in 6-12 Science Education. (3) Orientation to content, curriculum and methods appropriate for teaching science. Emphasis is on a critical examination of current trends and practices in the teaching of science. *(On demand)*

MDSK 6251. Issues in 6-12 Mathematics Education. (3) Orientation to content, curriculum and methods appropriate for teaching mathematics. Emphasis is on a critical examination of current trends and practices in the teaching of mathematics. *(On demand)*

MDSK 6254. Issues in 6-12 Social Studies Education. (3) Current issues in teaching and learning social studies. Emphasis on current trends in curriculum, advanced instructional methods, and research. *(On demand)*

MDSK. Advanced Methods in Middle Grades and Secondary English. (3) Examination of current research and scholarship on the teaching of English with particular emphasis on the development of instructional expertise.

MDSK 6260. Teacher Leadership. (3) An examination of the current research on adult learning and development, expert knowledge, and the professionalization of the field of teaching. Students develop skills to direct other education professionals.

Contact department for additional course descriptions not available at time of publication.

Courses in Secondary Education

SECD 5000. Topics in Secondary Education. (1-6) May include classroom and/or clinical experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

SECD 6000. Topics in Secondary Education. May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

SECD 6472. Secondary Education Clinical Experience. (3) Program of learning activities in the student's area of academic concentration in an approved secondary school setting. *(On demand)*

SECD 6475. Secondary Internship and Seminar. (3-6) Supervised clinical activities to develop and assess the student's ability to observe, analyze and recommend changes for curriculum and instruction in the secondary classroom. *(Fall, Spring)*

SECD 6800. Individual Study in Secondary Education. (1-6) Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

Advanced Graduate Only
SECD 7999. Graduate Residence. (0) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring)*

READING EDUCATION

Department of Reading and Elementary Education

5062 Colvard Building
(704) 547-4500
http://education.uncc.edu/reel/

Degree

M.Ed.

Coordinator

Dr. Karen Wood

Graduate Faculty

Patricia Douville-Ricker, Assistant Professor
Barbara A. Edwards, Associate Professor
Janet A. Finke, Associate Professor
William Dee Nichols, Assistant Professor
Robert J. Rickelman, Associate Professor
Karen D. Wood, Professor

Designed for experienced teachers, the M.Ed. Program in Reading Education qualifies graduates for the new Masters/Advanced Competencies "M" license in K-12 reading education. Relevant to all areas of the K-12 curriculum, this program is designed for classroom teachers and aspiring literacy specialists who are interested in improving instructional programs and practices that promote literacy among all learners.

Program Objectives

Based on guidelines published by the International Reading Association, the program prepares graduates to assume the role of a reading professional who (1) provides specialized K-12 literacy instruction and assessment in cooperation with other professionals to students in schools, reading resource centers, or clinics, (2) works cooperatively and collaboratively with other professionals in planning classroom and schoolwide programs to meet the needs of a diverse population of learners, (3) serves as a resource in the area of literacy education for teachers, administrators, and the community, and (4) provides leadership in literacy instruction through mentoring and staff development.

Additional Admission Requirements

In addition to the general requirements for admission to the Graduate School, applicants must (1) hold an A level license in any teaching field from the North Carolina Department of Public Instruction (or its equivalent from another state) and (2) have at least two years full time teaching experience.

Degree Requirements

The M.Ed. Program in Reading, Language, and Literacy Education requires a total of 39 hours of courses to be taken in three sequenced phases: Developing Plans and Perspectives (13 hours), Expanding Content and Pedagogical Knowledge (12 hours), Influencing Literacy Instruction (8 hours), plus 6 hours of electives.

Assistantships

The Department has a limited number of Graduate Assistantships. Typical stipends range from $5,600 to $6,000 for the academic year. Applications are available from the Department of Reading and Elementary Education, (704) 547-4500.

Phase I: Developing Plans and Perspectives (13 hrs.)

- READ 6100 Current Issues and Practices in Literacy (3)
- READ 6691A Seminar in Professional Development (1)
- RSCH 6101 Introduction to Educational Research (3)
- RSCH 6111 Qualitative Research Methods in Education (3)
- ENGL 6103 Juvenile Literature (3) OR
- ENGL 5104 Multiculturalism & Children's Literature (3)

Phase II: Expanding Content and Pedagogical Knowledge (12 hrs.)

- EDUC 6254 Teaching Diverse Learners (3)
- READ 6250 Emergent and Elementary Literacy (3)
- READ 6252 K-12 Writing Development and Instruction (3)
- READ 6255 Middle/Secondary Reading and Writing (3)

Phase III: Influencing Literacy Instruction (8 hrs.)

- READ 6260 Diagnostic Assessment and Instruction in Reading (3)
- READ 6474 Collaborative Leadership in Literacy Education (3)
- READ 6691B Seminar in Professional Development (2)

Elective Courses (6 hrs.)
Courses may be selected from the following categories and must be approved by the student's advisor: Pedagogy, Research, Diversity, Resources, and Leadership.

Capstone Experience

Students have the choice of a Master's Research Project or a Master's Comprehensive Portfolio, which is closely aligned with requirements of the National Board for Professional Teaching Standards. Either document will be presented to graduate students and faculty during READ 6691B: Seminar in Professional Development. Both the presentation and the document will be evaluated by a committee of graduate faculty using the department's scoring rubric.

Courses in Reading Education

READ 6000. Topics in Reading, Language, and Literacy. (1-6) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

READ 6100. Current Issues and Practices in Literacy Education. (3) Theories, research, and instructional methods associated with reading and the language arts, preschool through high school; questions of effectiveness related to instructional approaches and materials; related topics such as multicultural literacy, the role of phonics, and assessment. *(Fall, Spring, Summer) (Evenings)*

READ 6250. Language Development and Reading. (3) Prerequisite: Completion of Phase one. Critical reading and use of the literature in literacy education, examination of literacy content taught in the K-12 curriculum with individual emphasis at the teacher's level of licensure, multiple models and approaches for teaching and assessing learning in literacy development, required action research project. *(Fall, Spring)*

READ 6252 K-12 Writing Development and Instruction. (3) Prerequisite: Admission to Phase II of program. Theories, research, and critical issues related to students' writing development and effective writing instruction. Field experience and action research are required. *(Fall, Spring) (Evenings)*

READ 6255. Middle/Secondary Reading and Writing. (3) Prerequisite: Admission to Phase II of program. Theories, research, and instructional methods associated with reading and writing in the content areas, with a special emphasis on grades 6-12. Field experience and action research project are required. *(Fall, Spring, Summer, Evenings)*

READ 6260. Diagnostic Assessment and Instruction in Reading. (3) Prerequisite: Admission to Phase III of the Reading Education program. Examination, uses, and critique of theories and research about literacy processes and problems; diagnosis and correction of reading disabilities; instructional strategies and action research designed to improve reading proficiency. *(Fall) (Evenings)*

READ 6474. Collaborative Leadership in Literacy Education. (3) Prerequisites: Admission to Phase III and completion of READ 6260. Investigates models and strategies for assuming the leadership responsibilities of a literacy specialist, including mentoring, staff development, school-wide literacy program development and assessment, supporting the action research of teachers, and developing partnerships with parents and community volunteers. *(Spring) (Evenings)*

READ 6691. Seminar in Professional Development. (1-2) Prerequisites: None for READ 6691A: completion of READ 6260 for READ 6691B. Seminar focused on the self-direction and professional development of literacy specialists, with an increasing emphasis on becoming instructional leaders, as students plan to meet their own learning needs in instructional expertise; expand their awareness of the role of the literacy specialist; design, develop, and present their basic program portfolio and their Master's Research Project or Comprehensive Portfolio. (Taken for one credit in Phase I (READ 6691A) and two credits in Phase III (READ 6691B) for total of three credits.)*(Fall, Spring) (Evenings)*

READ 6800. Individual Study in Reading, Language, and Literacy. (1-6) Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

Advanced Graduate Only
READ 7999. Graduate Residence. (0) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring)*

SPECIAL EDUCATION

Degree and Credentials
M.Ed., Certificates

Department of Counseling, Special Education, and Child Development
Colvard 5055
(704) 547-2531
http://www.uncc.edu/colleges/education/cspc/main.htm

Coordinator
Dr. David W. Test

Graduate Faculty
Bob Algozzine, Professor
John Beattie, Assistant Professor
Diane Browder, Distinguished Professor
Mary Lynne Calhoun, Professor
Nancy Cooke, Associate Professor
Shelagh Gallagher, Assistant Professor
LuAnn Jordan, Assistant Professor
Fred Spooner, Professor
David Test, Professor
Richard White, Professor
Wendy Wood, Assistant Professor

SPECIAL EDUCATION
Master of Education

Program of Study
The mission of the Special Education (SPED) program is to "develop excellent professionals" for educational roles in public and private educational agencies and nonprofit agencies. The 39-hour M.Ed. in Special Education is organized around five major goals. These goals and related experiences are designed to help teachers become data-based decision makers. We believe that master teachers are self-reflective, lifelong learners who have an advanced understanding of child development, content, and pedagogy; and who use research, experience, and professional judgment to lead others in collaborative planning, implementation, and evaluation of effective instruction for students with disabilities. The program is responsive to expectations set forth by NCATE (National Council for the Accreditation of Teacher Education), NCDPI (North Carolina Department of Public Instruction), NBPTS (National Board of Professional Teacher Standards), CEC (Council for Exceptional Children), and the 1997 NC Excellent Schools Act. By focusing on "best practices" in special education and teacher education, the SPED program has established a model program that continuously achieves regional, state, and national recognition in scholarship, teaching, and research.

Additional Admission Requirements
For the M.Ed. in Special Education, an "A" level license in special education from the North Carolina Department of Public Instruction (or its equivalent from another state) is required. For the M.Ed. in Academically or Intellectually Gifted, an "A" level license in an elementary, middle, or secondary teaching field is required.

Affidavit from school principal verifying at least two years of full-time teaching experience.

Official transcripts of all previous academic work attempted beyond high school documenting undergraduate GPA of 2.75 overall and 3.0 in jr./sr. years.

Official agency reports of satisfactory GRE or MAT test scores (30^{th} percentile or above).

At least three evaluations from professional educators familiar with the applicant's personal and professional qualifications.

A one or two page essay describing the applicant's experience and objective in undertaking graduate study.

Degree Requirements

M.Ed. in Special Education

Phase I: Developing Perspective (10 hours)
- RSCH 6101 Educational Research Methods (3)
- EDUC 6254 Individualizing Instruction for Diverse Learners (3)
- ADMN 6106 Legal Issues in Special Education (3)
- SPED 6691a Seminar in Professional and Leadership Development (1)

Phase II: Content and Pedagogy (13 hours)
- SPED 6000 Topics in Special Education (3)
- SPED 6501 Applied Research in Special Education (3)
- SPED 6502 Advanced Classroom Management (3)
- SPED 6503 Instructional Design in Special Education (3)
- SPED 6691b Seminar in Professional and Leadership Development (1)

Electives (12 hours)

Phase III: Collaborative Leadership (4 hours)
- SPED 6690 Seminar in Collaboration (3)
- SPED 6691c Seminar in Professional and Leadership Development (1)

M.Ed. in Academically or Intellectually Gifted

Phase I: Developing Perspective (7 hours)
- RSCH 6101 Educational Research Methods (3)
- ADMN 6106 Legal Issues in Special Education (3)
- SPED 6691a Seminar in Professional and Leadership Development (1)

Phase II: Content and Pedagogy (22 hours)
- SPED 5211 Nature and Needs of Gifted Students (3)
- SPED 6000 Topics in Special Education (3)
- SPED 6124 Fundamentals of Instructional Adaptation for Gifted Students (3)
- SPED 6224 Contemporary Approaches to Instructional Adaptation for Gifted Students (3)
- SPED 6501 Applied Research in Special Education (3)
- SPED 6241 Curriculum Differentiation for Gifted Students (3)
- SPED 6691b Seminar in Professional and Leadership Development (1)
- SPED 6471 Internship: Academically or Intellectually Gifted (3)

Electives (6 hours)

Phase III: Collaborative Leadership (4 hours)
- SPED 6690 Seminar in Collaboration (3)
- SPED 6691c Seminar in Professional and Leadership Development (1)

Admission to Candidacy Requirements

Apply the semester prior to planned graduation. Full-time students must have completed 19 hours and be enrolled for at least an additional 10 hours. Part-time students must have completed at least 31 hours.

Assistantships

The Program typically has a limited number of graduate assistantships with salaries starting at $8,000/ academic year. Applications are available from the Department of Counseling, Special Education, and Child Development (704-547-2531).

Internships

The M.Ed. in Special Education does not require an internship. The M.Ed. in Academically and Intellectually Gifted requires an internship conducted in a public/private school classroom in order to obtain a teaching license.

Practica

Most courses require students to apply the knowledge learned in classes to public/private school classrooms.

Capstone Experiences

The capstone experience will be fulfilled by completing either a Master's Research Project or a Comprehensive Portfolio.

Electives

The M.Ed. in Special Education includes 12 elective hours. This will enable students to add-on an additional North Carolina teaching license in a disability area (i.e., behavioral-emotional disabilities, cross-categorical, learning disabilities, mental disabilities, severe and profound disabilities), complete the Graduate Certificate in Supported Employment and Transition, or complete an individualized set of courses developed as a result of participating in the first SPED 6691 seminar or from discussing possibilities with their advisor. Students in the M.Ed. in Academically and Intellectually Gifted program have 6 elective hours.

Advising

Upon acceptance into the program all students are assigned an advisor. Students are expected to meet with their advisor each semester to discuss their coursework.

Licensure

Successful completion will lead to a North Carolina masters/advanced competencies license.

Committees

Each student will have a committee of three graduate faculty members who will provide guidance through the Capstone Experience. The committee will include the student's advisor, as well as two additional graduate faculty chosen by the student.

Application for Degree
Apply the semester prior to planned graduation. Full-time students must have completed 19 hours and be enrolled for at least an additional 10 hours. Part-time students must have completed at least 31 hours.

Research Opportunities/Experiences
The Special Education faculty continuously achieve regional, state, and national recognition in scholarship, teaching, and research. As a result students will have multiple opportunities to become involved in practical, classroom-based research. In addition "action-research" projects are required in a variety of courses.

Tuition Waivers
A person qualifies for in-state tuition if he/she; is paid on the teacher salary schedule, has established legal residence in North Carolina, is employed full-time by a North Carolina public school, but only for "courses relevant to teacher certification or to professional development as a teacher."

Financial Aid/ Financial Assistance
Information is available from the Office of Student Academic Services located in Colvard 3022 (704) 547-2508).

Program Certifications/Accreditation
Both the Special Education M.Ed. Program and the Academically and Intellectually Gifted M.Ed. Program are fully accredited by NCATE, CEC, and NCDPI.

SPECIAL EDUCATION
Graduate Certificate

Students who hold a Bachelors Degree from an accredited university can obtain an initial North Carolina Special Education teaching license in one of four areas - - Behavioral-Emotional Disabilities, Learning Disabilities, Mental Disabilities, or Severe and Profound Disabilities - - through the Graduate Certificate in Special Education program.

Initial Licensure in Special Education
Specialization in Behavioral-Emotional Disabilities: This initial licensure program prepares educational professionals to provide instructional services to students with behavioral and emotional disabilities in resource, self-contained, and consultative settings. Course content includes definition, identification, alternative conceptual models, assessment alternatives, management alternatives, and instructional alternatives including social skills, school survival, and affective curricula. Coursework provides an opportunity for development and implementation of appropriate IEPs and related interventions for students with behavioral and emotional disabilities. This program leads to eligibility for an initial North Carolina Teacher Licensure in Special Education: Behavioral-Emotional Disabilities (K-12).

Option A: Teachers with a non-special education license (18 hours + applicable PRAXIS tests)

Requirements
- SPED 5270 Classroom Management (3)
- SPED 6130 Diagnostic Assessment (3)

Additional Course Requirements (Choose ONE)
- SPED 5272 Teaching Mathematics to Learners with Special Needs (3)
- SPED 5276 Teaching Language Arts to Learners with Special Needs (3)
- SPED 5170 Special Education Collaboration and Consultation (3)
- SPED 6316 Transition and Life Skills (3)

Specialization
- SPED 6114 Behavioral-Emotional Disabilities (3)
- SPED 6122 Methods and Materials: Behavioral-Emotional Disabilities (3)
- SPED 6473 Internship: Behavioral-Emotional Disabilities (3)

Option B: Lateral Entry Teachers (27 hours + applicable PRAXIS tests)

Requirements
- SPED 6100 Introduction to Special Education (3)
- SPED 5270 Classroom Management (3)
- SPED 6130 Diagnostic Assessment (3)

Additional Course Requirements (Choose THREE)
- SPED 5272 Teaching Mathematics to Learners with Special Needs (3)
- SPED 5276 Teaching Language Arts to Learners with Special Needs (3)
- SPED 5170 Special Education Collaboration and Consultation (3)
- SPED 6316 Transition and Life Skills (3)

Specialization
- SPED 6114 Behavioral-Emotional Disabilities (3)
- SPED 6122 Methods and Materials: Behavioral-Emotional Disabilities (3)
- SPED 6473 Internship: Behavioral-Emotional Disabilities (3)

Option C: Students without a license or teaching position (30 hours + PRAXIS tests + Technology Portfolio)

Requirements
- SPED 6100 Introduction to Special Education (3)
- SPED 5270 Classroom Management (3)
- SPED 6130 Diagnostic Assessment (3)

Additional Course Requirements (Choose THREE)

SPED 5272	Teaching Mathematics to Learners with Special Needs (3)
SPED 5276	Teaching Language Arts to Learners with Special Needs (3)
SPED 5170	Special Education Collaboration and Consultation (3)
SPED 6316	Transition and Life Skills (3)

Specialization

SPED 6114	Behavioral-Emotional Disabilities (3)
SPED 6122	Methods and Materials: Behavioral-Emotional Disabilities (3)
SPED 6473	Internship: Behavioral-Emotional Disabilities (6)

Initial Licensure in Special Education

Specialization in Learning Disabilities: This initial licensure program places emphasis on the learning disabilities specialist's role in coordinating and providing comprehensive educational services to students with learning disabilities. The program prepares educational professionals to address both the academic and social needs of students through a variety of instructional approaches. The program includes instruction and experience in identification, assessment, instructional strategies, and multidisciplinary cooperation. This program leads to eligibility for initial North Carolina Teacher Licensure in Special Education: Learning Disabilities (K-12).

Option A: Teachers with a non-special education license (18 hours + applicable PRAXIS tests)

Requirements

SPED 5270	Classroom Management (3)
SPED 6130	Diagnostic Assessment (3)

Additional Course Requirements (Choose ONE)

SPED 5272	Teaching Mathematics to Learners with Special Needs (3)
SPED 5276	Teaching Language Arts to Learners with Special Needs (3)
SPED 5170	Special Education Collaboration and Consultation (3)
SPED 6316	Transition and Life Skills (3)

Specialization

SPED 6112	Learning Disabilities (3)
SPED 6123	Methods and Materials: Learning Disabilities (3)
SPED 6472	Internship: Learning Disabilities (3)

Option B: Lateral Entry Teachers (27 hours + applicable PRAXIS tests)

Requirements

SPED 5270	Classroom Management (3)
SPED 6100	Introduction to Special Education (3)
SPED 6130	Diagnostic Assessment (3)

Additional Course Requirements (Choose THREE)

SPED 5272	Teaching Mathematics to Learners with Special Needs (3)
SPED 5276	Teaching Language Arts to Learners with Special Needs (3)
SPED 5170	Special Education Collaboration and Consultation (3)
SPED 6316	Transition and Life Skills (3)

Specialization

SPED 6112	Learning Disabilities (3)
SPED 6123	Methods and Materials: Learning Disabilities (3)
SPED 6472	Internship: Learning Disabilities (3)

Option C: Students without a license or teaching position (30 hours + PRAXIS tests + Technology Portfolio)

Requirements

SPED 5270	Classroom Management (3)
SPED 6100	Introduction to Special Education (3)
SPED 6130	Diagnostic Assessment (3)

Additional Course Requirements (Choose THREE)

SPED 5272	Teaching Mathematics to Learners with Special Needs (3)
SPED 5276	Teaching Language Arts to Learners with Special Needs (3)
SPED 5170	Special Education Collaboration and Consultation (3)
SPED 6316	Transition and Life Skills (3)

Specialization

SPED 6112	Learning Disabilities (3)
SPED 6123	Methods and Materials: Learning Disabilities (3)
SPED 6472	Internship: Learning Disabilities (6)

Initial Licensure in Special Education

Specialization in Mental Disabilities: This initial licensure program prepares educational professionals to work with learners with mental disabilities in resource, self-contained, and consultative settings. Educational programs for students who have mild to moderate mental disabilities (also known as mental retardation) emphasize the functional academics, as well as independent living, academic, and adaptive behavior skills necessary to live fully as members of families and communities. The program emphasizes effective instructional practices, collaborative efforts with other professionals and parents, and community-based clinical experiences. This program leads to eligibility for an initial North Carolina Teacher Licensure in Special Education: Mental Disabilities (K-12).

Option A: Teachers with a non-special education license (18 hours + applicable PRAXIS tests)

Requirements

SPED 5270	Classroom Management (3)

SPED 6130 Diagnostic Assessment (3)

Additional Course Requirements (Choose ONE)
- SPED 5272 Teaching Mathematics to Learners with Special Needs (3)
- SPED 5276 Teaching Language Arts to Learners with Special Needs (3)
- SPED 5170 Special Education Collaboration and Consultation (3)
- SPED 6316 Transition and Life Skills (3)

Specialization
- SPED 6113 Mental Disabilities (3)
- SPED 6121 Methods and Materials: Mental Disabilities (3)
- SPED 6474 Internship: Mental Disabilities (3)

Option B: Lateral Entry Teachers (27 hours + applicable PRAXIS tests)

Requirements
- SPED 5270 Classroom Management (3)
- SPED 6100 Introduction to Special Education (3)
- SPED 6130 Diagnostic Assessment (3)

Additional Course Requirements (Choose THREE)
- SPED 5272 Teaching Mathematics to Learners with Special Needs (3)
- SPED 5276 Teaching Language Arts to Learners with Special Needs (3)
- SPED 5170 Special Education Collaboration and Consultation (3)
- SPED 6316 Transition and Life Skills (3)

Specialization
- SPED 6113 Mental Disabilities (3)
- SPED 6121 Methods and Materials: Mental Disabilities (3)
- SPED 6474 Internship: Mental Disabilities (3)

Option C: Students without a license or teaching position (30 hours + PRAXIS tests + Technology Portfolio)

Requirements
- SPED 5270 Classroom Management (3)
- SPED 6100 Introduction to Special Education (3)
- SPED 6130 Diagnostic Assessment (3)

Additional Course Requirements (Choose THREE)
- SPED 5272 Teaching Mathematics to Learners with Special Needs (3)
- SPED 5276 Teaching Language Arts to Learners with Special Needs (3)
- SPED 5170 Special Education Collaboration and Consultation (3)
- SPED 6316 Transition and Life Skills (3)

Specialization
- SPED 6113 Mental Disabilities (3)
- SPED 6121 Methods and Materials: Mental Disabilities (3)
- SPED 6474 Internship: Mental Disabilities (6)

Initial Licensure in Special Education

Specialization in Severe and Profound Disabilities: This initial licensure program prepares educational professionals to work with students who have severe and profound disabilities in a variety of school and community settings. Community-based, integrated settings are emphasized. Curricular issues center on providing students with functional, community-referenced skills. This program leads to eligibility for initial North Carolina Teacher Licensure in Special Education: Severe and Profound Disabilities (K-12).

Option A: Teachers with a non-special education license (18 hours + applicable PRAXIS tests)

Requirements
- SPED 5270 Classroom Management (3)
- SPED 6126 Methods for Teaching Persons with Severe Disabilities (3)

Additional Course Requirements (Choose ONE)
- SPED 5170 Special Education Collaboration and Consultation (3)
- SPED 6630 Problems and Issues of Persons with Severe Disabilities (3)
- SPED 6121 Methods and Materials: Mental Disabilities (3)
- SPED 6316 Transition and Life Skills (3)
- SPED 6321 Community-based Instruction (3)
- SPED 6351 Interagency Collaboration (3)

Specialization
- SPED 6117 Introduction to Persons with Severe Disabilities (3)
- SPED 6127 Curriculum for Persons with Severe Disabilities (3)
- SPED 6474 Internship: Mental Disabilities (3)

Option B: Lateral Entry Teachers (27 hours + applicable PRAXIS tests)

Requirements
- SPED 5270 Classroom Management (3)
- SPED 6100 Introduction to Special Education (3)
- SPED 6127 Curriculum for Persons with Severe Disabilities (3)

Additional Course Requirements (Choose THREE)
- SPED 5170 Special Education Collaboration and Consultation (3)
- SPED 6630 Problems and Issues of Persons with Severe Disabilities (3)
- SPED 6121 Methods and Materials: Mental Disabilities (3)
- SPED 6316 Transition and Life Skills (3)
- SPED 6321 Community-based Instruction (3)

SPED 6351 Interagency Collaboration (3)

Specialization
SPED 6117 Introduction to Persons with Severe Disabilities (3)
SPED 6126 Methods for Teaching Persons with Severe Disabilities (3)
SPED 6474 Internship: Mental Disabilities (3)

Option C: Students without a license or teaching position (30 hours + PRAXIS tests + Technology Portfolio)

Requirements
SPED 5270 Classroom Management (3)
SPED 6126 Methods for Teaching Persons with Severe Disabilities (3)
SPED 6100 Introduction to Special Education (3)

Additional Course Requirements (Choose THREE)
SPED 5170 Special Education Collaboration and Consultation (3)
SPED 6630 Problems and Issues of Persons with Severe Disabilities (3)
SPED 6121 Methods and Materials: Mental Disabilities (3)
SPED 6316 Transition and Life Skills (3)
SPED 6321 Community-based Instruction (3)
SPED 6351 Interagency Collaboration (3)

Specialization
SPED 6117 Introduction to Persons with Severe Disabilities (3)
SPED 6127 Curriculum for Persons with Severe Disabilities (3)
SPED 6474 Internship: Mental Disabilities (6)

Admission Requirements for Graduate Certificate in Special Education

Students must have a bachelor's degree from a regionally accredited university.

1) Students must submit an Application for Admission to a Graduate Program (available from the Graduate School in Kennedy 332; 704-547-3366).
2) Students must provide original transcripts that indicate a minimum overall GPA of at least 2.75 and a junior/senior GPA of at least 3.0.
3) Students are *not* required to take the GRE or MAT. However, students must take the GRE or MAT before applying to the Special Education master's degree program.
4) If accepted into the master's degree program, a maximum of twelve (12) Graduate Certificate hours may be applied to the master's degree program in Special Education with the consent of the Graduate Program Coordinator.
5) Admission to the Graduate Certificate program does not ensure admission into a master's degree program.

Students who do not meet the requirements for the Graduate Certificate Program, should apply to the post-baccalaureate program.

Post-baccalaureate Admission Information

1) Students must have a bachelor's degree from a regionally accredited university.
2) Complete an Application for Admission as a post-baccalaureate student (available from the Graduate School in Kennedy 332; 704-547-3366).
3) Send an official undergraduate transcript to: Dr. David W. Test, Graduate Coordinator, Special Education Program, UNC Charlotte, 9201 University City Blvd., Charlotte, NC 28223.
4) If accepted into a master's degree program, a maximum of six (6) post-baccalaureate hours may be applied towards a master's degree program with the consent of the Graduate Program Coordinator.

SUPPORTED EMPLOYMENT and TRANSITION

Graduate Certificate

The Graduate Certificate Program in Supported Employment and Transition is a 12-hour program. It serves two groups of educational professionals: Those who work in adult human-service agencies that provide on-the-job training and support (supported employment) for individuals with disabilities and those who work in school systems and are responsible for helping students with disabilities prepare to live, work, and learn as adults (transition from school to adulthood).

Program Objectives

As specialists in supported employment and transition for youth who have disabilities, graduates of the program are prepared to:
Work as job coaches and employment training specialists
Provide community-based training for persons with disabilities
Assist students in making the transition from school to adulthood.

Additional Requirements for Admission

Applicants to the program in Supported Employment and Transition are admitted to the Graduate School in a special category for certificate students. Admission requirements are listed in the Graduate School section of the catalog. Admission to a graduate certificate program at UNC Charlotte does not ensure subsequent admission to a graduate degree program.

Certificate Requirements

The Graduate Certificate Program in Supported Employment and Transition requires a minimum of 12

semester hours, at least six of which must be at the 6000 level. No transfer credit is accepted, although UNC Charlotte "distance learning" courses in Supported Employment and Transition may be applied to meet the program's requirements. Students must earn grades of B or better in each of the courses in the 12-hour program of study. The program includes the following core courses and support courses:

Core Courses (6 hours)

SPED 6311	Introduction to Supported Employment (3) or
SPED 6316	Transition and Life Skills (3)
SPED 6321	Community-based Instruction (3)

Support Courses (6 hours) Choose two of the following courses:

SPED 6351	Interagency Collaboration (3)
SPED 6640	Seminar in Special Education: Working with Families (3)
SPED 6000	Topics in Special Education (3)
SPED 6311	Introduction to Supported Employment (3)
SPED 6316	Community-based Instruction (3)
SPED 6474	Internship: Mental Disabilities (3)

Courses in Special Education

SPED 5000. Topics in Special Education. (1-6) May include classroom and/or clinical experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

SPED 5011. Issues in Preschool Education for Children with Disabilities. (3) Current issues and trends in early intervention and preschool services for young children with disabilities and their families. Includes field trips scheduled throughout the semester. *Fall)*

SPED 5110. Assessment in Special Education: Preschool. (3) Strategies for interdisciplinary educational assessment to identify needs and plan appropriate programs for young children with disabilities and their families. Approximately 20 hours of field experiences. *(Fall)*

SPED 5170. Special Education Consultation and Collaboration. (3) Methods for multidisciplinary planning, co-teaching with general educators in inclusive settings, utilizing paraeducators effectively, working with parents of exceptional students, and building collaborative interagency services for students with disabilities. *(Fall, Spring)*

SPED 5210. Instructional Methods and Materials: The Early Years. (3) Goal-setting, instructional design, and strategies for teaching young children with disabilities and their families. Includes a field-based assignment of approximately 20 hours. *(Spring)*

SPED 5211. Nature and Needs of Gifted Students. (3) Examination of the historical and philosophical perspectives of education for gifted and talented learners with emphasis on answering the question "What is giftedness?" Issues explored in the course include identification procedures, instructional options, the nature of intelligence and creativity, laws/policies, psychological and emotional correlates of talent, and current research findings. *Spring)*

SPED 5270. Classroom Management. (3) Theoretical context and related applied strategies necessary to manage effectively the classroom behaviors of individuals or groups of students. Requires a field-based assignment of approximately 10 hours. *(Fall, Spring)*

SPED 5272. Teaching Mathematics to Learners with Special Needs. (3) Strategies, techniques, and activities to teach functional mathematics to students with special needs. Assessment issues, an exploration of developmental, remedial, and functional mathematics, curricular modifications, and functional applications. Requires two hours of field-based work in schools each week. *Fall, Spring)*

SPED 5276. Teaching Language Arts to Learners with Special Needs. (3) Knowledge and practice in remediating language arts deficits and providing sound developmental instruction for learners who have special needs. Approximately 20 hours of field experiences. *(Fall, Spring)*

SPED 6000. Topics in Special Education. (1-6) May include classroom and/or clinical experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

SPED 6100. Introduction to Special Education. (3) Examination of the historical antecedents of contemporary practices in the field of special education with emphasis on the conceptual models of child variance and current trends in the field of education.*(Fall, Spring, Summer)*

SPED 6112. Learning Disabilities. (3) Examination of learning disabilities with emphasis on theories, issues, current trends, and definitions of learning disabilities as well as instructional strategies, program models, and major contributions to the field *(Fall, Summer)*

SPED 6113. Mental Disabilities. (3) Examination of historical antecedents, major contributors, current practices, issues, and trends in the field of mental retardation. *(Spring)*

SPED 6114. Behavioral-Emotional Disabilities. (3) Examination of major contributors, theories, issues,

current trends, and current practices in the field of behavior disorders. *(Spring)*

SPED 6115. Mild Disabilities. (3) Examination of theories and practice of cross-categorical programming, with emphasis on theories, issues, current trends, current practices, and consultation practices. *(On demand)*

SPED 6117. Introduction to Persons with Severe Disabilities. (3) Social and cultural antecedents to contemporary services for persons with severe disabilities and the needs of these individuals within a developmental framework. *(Fall)*

SPED 6121. Methods and Materials: Mental Disabilities. (3) Examination of the principles and practices of curriculum development and modification and current instructional methodologies for learners with mental disabilities. *(Fall)*

SPED 6122. Methods and Materials: Behavioral-Emotional Disabilities. (3) Planning, implementation, and evaluation of instructional programs with emphasis on academic and behavioral strategies, and individualization instruction for learners with behavioral-emotional disabilities. *(Fall)*

SPED 6123. Methods and Materials: Learning Disabilities. (3) Planning, implementation, and evaluation of instructional programs with emphasis on individual instruction, grouping for instruction, consultation, assessment, and program planning for learners with learning disabilities. *(Spring)*

SPED 6124. Fundamentals of Instructional Adaptation for Gifted Students. (3) Prerequisite: SPED 5211. An introduction to the basic skills necessary to plan, implement, and evaluate instructional procedures that facilitate learning by gifted students. Specific theories discussed include Bloom, Bruner, Krathwohl, Parnes, Kohlberg. *(Fall)*

SPED 6125. Instructional Practices: Cross-Categorical. (3) Assessment procedures appropriate for use with students who are mildly disabled. Assessment information will be used to plan for the most appropriate instruction for students with mild disabilities receiving education in a cross-categorical setting. *(On demand)*

SPED 6126. Methods for Teaching Persons with Severe Disabilities. (3) Corequisite: SPED 6127. Principles and procedures used to program instruction for persons who have severe disabilities. Students are required to design and implement an instructional program. *(Spring)*

SPED 6127. Curriculum for Persons with Severe Disabilities. (3) Corequisite: SPED 6126. Selection of instructional programs appropriate for use with persons with severe disabilities. The student identifies strengths and weaknesses of educational programs and makes recommendations of their use with those persons. *(Spring)*

SPED 6130. Diagnostic Assessment. (3) Principles and practice of educational problem solving with emphasis on formal assessment, special education eligibility, and linkages between assessment and instruction. *(Fall, Spring)*

SPED 6224. Contemporary Approaches to Instructional Adaptation for Gifted Students. (3) Prerequisites: SPED 5211, SPED 6124. A survey of modern models of reasoning, creativity, problem solving, and ethics and methods to plan, implement, and evaluate lessons based on those models. *(Spring)*

SPED 6241. Curriculum Differentiation for Gifted Students. (3) Prerequisites: SPED 5211, SPED 6124. Models of curriculum development and program structures for academically or intellectually gifted students. Emphasis on integrating the philosophy of teacher, school and community with child characteristics to create the appropriate course of study in a variety of school settings. *(Spring)*

SPED 6311. Introduction to Supported Employment. (3) Introduction to the concept of supported employment including models of supported employment, social skills in the workplace, assessment, and importance of independent living skills. *(Fall)*

SPED 6316. Transition and Life Skills. (3) Methods and procedures used in preparing students with disabilities for the world of work and independence are studied. *(Fall)*

SPED 6321. Community-Based Instruction. (3) Prerequisite: SPED 6311. Examination of curriculum guidelines for successful supported employment programs, norm-referenced and criterion-referenced assessment, independent living skills, and social skills in the workplace. *(Spring)*

SPED 6351. Interagency Collaboration. (3) Prerequisites: SPED 6311 and 6321. Analysis of existing interagency agreements and practicum experiences with individuals from agencies providing supported employment or transition services. *(On demand)*

SPED 6470. Special Education Clinical Experience. (3) Prerequisite: Permission of department. Program of experiential learning activities in the student's level and/or area of academic concentration in an approved school setting. *(Fall, Spring)*

SPED 6471. Internship: Academically or Intellectually Gifted. (3) Prerequisites: SPED 5211, SPED 6124, SPED 6641; approval of department. Supervised experiences in observation, instruction, and administration of programs with gifted and talented

students. Offered only on a Pass/No Credit grading. *(Spring)*

SPED 6472. Internship: Learning Disabilities. (3-6) Prerequisite: Approval of department. Supervised experiences in observation, instruction, and administration of programs for students with learning disabilities. Offered only on a Pass/No Credit grading. *(Fall, Spring)*

SPED 6473. Internship: Behavioral-Emotional Disabilities. (3-6) Prerequisite: Approval of department. Supervised experiences in observation, instruction, and administration of programs for students with behavioral-emotional disabilities. Pass/No Credit grading. *(Fall, Spring)*

SPED 6474. Internship: Mental Disabilities. (3-6) Prerequisite: Approval of department. Supervised experiences in observation, instruction, and administration of programs for students who have mental disabilities. Offered only on a Pass/No Credit grading. *(Fall, Spring)*

SPED 6475. Internship: Mild Disabilities. (3-6) Prerequisite: Approval of department. Supervised experiences in observation, instruction, and administration of programs for students who have special needs. Offered only on a Pass/No Credit grading *(Fall, Spring)*

SPED 6501. Applied Research in Special Education. (3) Prerequisite: RSCH 6101. In-depth study of single-subject and qualitative research methods as they apply to the field of special education including data collection, research designs, data display and analysis, and writing research reports. *(Spring) (Evenings)*

SPED 6502. Advanced Classroom Management. (3) Prerequisite: SPED 6501. Advanced theoretical context and related applied strategies necessary to manage and maintain effectively the classroom behaviors of individuals or groups of students. Field-based assessments of approximately 10 hours are required *(Spring) (Evenings)*

SPED 6503. Instructional Design in Special Education. (3) Prerequisite: SPED 6501 or may be taken concurrently. Advanced instructional design for learners who have significant difficulty in performing academic tasks with typical instruction. The course provides strategies for classroom-based assessment of individual needs using curriculum analysis, task analysis, and error analysis. It provides a framework for designing instructional sequences and error correction procedures that optimize progress. Field-based experiences of approximately 10 hours are required *(Fall)*

SPED 6630. Problems and Issues of Persons with Severe Disabilities. (3) Issues, trends, and practices in the education of persons with severe disabilities which master teachers and supervisors may encounter with this population. *Fall)*

SPED 6640. Seminar in Special Education: Working with Families. (3) Issues and best practices in developing family-professional partnerships to support the development of persons with disabilities. Pass/No Credit grading. *(On demand)*

SPED 6641. Seminar in Curriculum Development: Gifted and Talented. (3) Procedures and suggestions for developing programs for academically or intellectually gifted learners; philosophy of the teacher; school and community assumptions of curriculum; child characteristics; parental concerns; teaching styles. *(Spring)*

SPED 6690. Seminar in Collaboration. (3) Prerequisites: SPED 6501, 6502, and 6503. Advanced knowledge and skills in collaborating with parents, general education teachers, paraprofessionals, related service personnel, and/or human service personnel. *(Spring)*

SPED 6691. Seminar in Professional and Leadership Development. (1) Design, development, and presentation of Master's Research Project or Comprehensive Portfolio. (Must be repeated once per program phase for a total of 3 credit hours.) *(Fall, Spring)*

SPED 6800. Individual Study in Special Education. (1-6) Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit *(Fall, Spring, Summer)*

SPED 7999. Graduate Residence. (0) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring)*

TEACHING ENGLISH as a SECOND LANGUAGE

Degree
M.Ed.

Department of Middle Grades, Secondary and K-12 Education
5000 Colvard Building
(704) 547-4521

Coordinator
Dr. Caroline Linse

Program of Study

There are two different tracks for the Master's Degree Program. There is the licensure track and the non-licensure track. The licensure track requires students to possess an "A" level license in another teaching discipline to receive licensure in ESL. The non-licensure program has no such requirements.

Licensure Track

Students must possess an "A" level licensure in another teaching discipline to receive licensure to teach ESL. Check with the Department of Middle Grades, Secondary and K-12 Education (MDSK) for the specific requirements.

Teaching English as a Second Language (Licensure)

I. Foundations (12 hours)
- EDUC 7126 Comparative Education (3)
- ENGL 6161 Introduction to Linguistics (3)
- ENGL 6163 Language Acquisition (3)

One course from the following:
- ENGL 5165 Language and Culture (3)
- ANTH 5120 Intercultural Communications (3)
- ANTH 5110 American Ethnic Cultures (3)

II. Curriculum (9 hours)
- TESL 5101 Second Language Diagnosis and Evaluation (3)
- CURR 6356 Curriculum Studies (3)

III. Specialization (15 hours)
- TESL 5103 Teaching English as a Second Language (3)
- RSCH 6101 Educational Research Methods (3)
- MDSK 6260 Teacher Leadership (3)
- Choose Two (2) Electives

IV. Internship (3 hours)
- TESL 6476 Seminar: The ESL Professional in the 21st Century

Non-Licensure Track

Students do not need to possess any teaching license to receive a Master's degree in Teaching English as a Second Language. Check with the Department of MDSK for the specific requirements.

I. Foundations (12 hours)
- ENGL 6161 Introduction to Linguistics (3)
- ENGL 5263 Linguistics and Language Learning (3)

One course from the following:
- ENGL 5165 Language and Culture (3)
- ANTH 5120 Intercultural Communications (3)
- ANTH 5110 American Ethnic Cultures (3)
- Choose one elective course

II. Curriculum (12 hours)
- ENGL 5166 Comparative Language Studies for Teachers (3)
- TESL 5101 Second Language Diagnosis and Evaluation (3)
- CURR 6356 Curriculum Studies (3)
- Choose one elective course

III. Specialization (12 hours)
- TESL 5103 Teaching English as a Second Language (3)
- READ 6250 Language Development and Reading (3)
- RSCH 6101 Educational Research Methods (3)
- TESL 6470 Clinical Experience in TESL (3)

IV. Internship (3 hours)
- TESL 6476 Seminar: - The ESL Professional in the 21st Century

Admission Requirements
Must meet all admission requirements as set forth by the College of Education and the Graduate School.

Internship

Required for both licensure and non-licensure program. Both Domestic and International Internships are available.

Comprehensive Examination

Students select the Master's Research Project or the Comprehensive Portfolio to fulfil this requirement.

Language Requirements

Show evidence of 1 semester of a foreign language at the college level.

Assistantships

A very limited number of assistantships are available through the Department of MDSK. There may also be opportunities for teachers to work in the English Language Teaching Institute on campus.

Research Opportunities

There are numerous opportunities for students to participate in courses and programs abroad.

Committees

Students work with a three member faculty committee to fulfil the Comprehensive Examination Requirement. One of the members of the committee is the student's advisor.

Courses in Teaching English as a Second Language

TESL 5101. Second Language Diagnosis and Evaluation (3) For current and future teachers of English as a Second Language (TESL) to develop multiple criteria assessment models as TESL

diagnosticians and to master other competencies prescribed by the State of North Carolina.*(Spring)*

TESL 5103. Teaching English as a Second Language. (3) For current and future teachers of English as a Second Language (TESL) to master a variety of approaches, methods, and techniques of teaching ESL and other competencies prescribed by the State of North Carolina. *(Fall)*

TESL 6000. Topics in Teaching English as a Second Language. (1-6) May include classroom and/or clinical experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

TESL 6470. Clinical Experience in Teaching English as a Second Language. (3) Prerequisite: Permission of department. Program of experiential learning activities in the student's level and/or area of academic concentration in an approved school setting. *(Fall, Spring)*

TESL 6476. Seminar and Internship in Teaching English as a Second Language. (3) Prerequisite: Permission of department. Supervised experiences in school or non-school teaching or training with an emphasis on developing skills as an educational professional. *(Fall, Spring)*

TESL 6800. Individual Study in Teaching English as a Second Language. (1-6) Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

TESL 7999. Graduate Residence. (0) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring)*

ENGINEERING

CIVIL ENGINEERING

Department of Civil Engineering

264 Smith Building
(704) 547-2304
http://www.ce.uncc.edu/

Degrees

MSE, MSCE,
Doctoral Study (Cooperative with NCSU)

Coordinator

Dr. Jy S. Wu

Graduate Faculty

James Bowen, Assistant Professor
Jack Evett, Professor Emeritus
Janos Gergely, Assistant Professor
Johnny Graham, Associate Professor
Helene Hilger, Assistant Professor
Rajaram Janardhanam, Professor
Martin Kane, Assistant Professor
Ellis King, Professor
Alan Stadler, Assistant Professor
Jy S. Wu, Professor
David Young, Associate Professor and Chairman

Program of Study

The Department of Civil Engineering provides opportunities for discipline-specific and multidisciplinary graduate-level education in civil engineering. Advanced course work and research are used to enhance professional development, improve technical competency, and provide a life-long learning experience. Doctoral studies leading to the degree of Doctor of Philosophy (Ph.D.) are available through a cooperative arrangement with North Carolina State University (NCSU). The Department offers graduate studies in four areas of concentration: environmental and water resources engineering, geotechnical engineering, structural engineering and structural materials, and transportation engineering.

Additional Admission Requirements

Admission requirements to the master's program include an earned undergraduate degree in civil engineering or a closely related field, an undergraduate GPA of 3.0 or better, a satisfactory score from the Aptitude Portion of the GRE, three letters of recommendation, a TOEFL score of 550 or better for international students, and any other appropriate credentials as required by the Graduate School. Admission requirements to the Ph.D. program include an earned master's degree in engineering or a related field with GPA of 3.5 or better. Acceptance by both UNC Charlotte and NCSU constitute admission to this Ph.D. program. The degree of Doctoral of Philosophy is awarded by NCSU; however, the majority of course work and dissertation research can be conducted at UNC Charlotte.

Undergraduate students with outstanding academic performance may be admitted to the Early Entry Program to pursue graduate study while completing the undergraduate degree requirements. Students must have a minimum GPA of 3.2 and must have completed at least 75 hours toward the BSCE degree.

Conditional admission to the master's program may be given to applicants with deficiencies in their civil engineering background.

Application Deadline
Applications will be received by the Graduate Admission Office anytime prior to their published deadlines. Students seeking assistantships or tuition grants should apply by February 15. The Department will make the first round of decisions by March 15 for awards of TA's for the following academic year.

Assistantships
Research and teaching assistantships and tuition remissions are available from the department on a competitive basis to highly qualified applicants/students.

Tuition Waivers
Tuition Waivers available on a competitive basis for both out-of-state and in-state students.

Admission to Candidacy Requirements
Each student is required to submit a Plan of Study to the Department's Graduate Coordinator by the end of the second semester or before completing 18 hours of graduate credit. The Plan of Study is to be filed in the Department of Civil Engineering with a copy sent to the College of Engineering.

Upon completion of a substantial amount of graduate work and in no case later than two weeks prior to the beginning of the semester in which the student expects to complete all requirements for the degree, the student shall file for Admission to Candidacy.

Application for Degree
Each student should make application for degree prior to graduation.

Transfer Credit
The Department accepts the transfer of two graduate courses taken from another institution or UNC Charlotte prior to admission to the master's program in civil engineering.

Core Courses
See course options for specific tracks. A minimum of 30 approved graduate credit hours including electives and thesis/research project is required for graduation. At least half of the semester hours must be in courses numbered 6000 or above. Both thesis and research project options exist. Six hours of thesis or three hours of project research are included in the 30-hour requirement.

Electives
Typically two graduate courses outside CEGR are required. However, an individual with a non-CEGR background may substitute the outside-CEGR requirement with CEGR courses.

Track Descriptions

Recommended courses for the various tracks in environmental engineering are:

Water Resources: CEGR 5142, CEGR 5145, CEGR 5182, CEGR 5144, CEGR 5146, CEGR 5236, CEGR 5237, CEGR 5243, CEGR 6141, CEGR 6146, CEGR 6147, and CEGR 6148.

Treatment Process and Technology: CEGR 5141, CEGR 5142, CEGR 5143, CEGR 5241, CEGR 5234, CEGR 5253, CEGR 5243, CEGR 6142, CEGR 6143, CEGR 6144, CEGR 6145, CEGR 6171, CEGR 6172, and CEGR 6173.

Environmental Systems and Management: CEGR 5142, CEGR 5143, CEGR 5145, CEGR 5182, CEGR 5144, CEGR 5234, CEGR 5235, CEGR 5236, CEGR 5237, CEGR 5243, CEGR 6148, CEGR 6171, CEGR 6172, MBAD 6195, and EMGT 6901.

Recommended courses for the two tracks in geotechnical engineering are:

Geotechincal engineering: CEGR 5264, CEGR 5270, CEGR 5271, CEGR 5272, CEGR 5278, CEGR 6252. CEGR 6268, and CEGR 6278.

Geoenvironmental engineering: CEGR 5264, CEGR 5272, and CEGR 6278.

Recommended courses for the two tracks in structural engineering are:

Structural analysis and design: CEGR 5108, CEGR 5121, CEGR 5123, CEGR 5124, CEGR 5222, CEGR 5224, CEGR 5226, CEGR 6126, CEGR 6127, CEGR 6128, and CEGR 6129.

Structural materials: CEGR 5108, , CEGR 6090C, CEGR 6090S, CEGR 6127, and MEGR 6141.

Required core courses for transportation engineering are:

CEGR 5161, CEGR 6161, and one of the following: GEOG 6100, MATH 6107, or MATH 6172.

Advising
Each student will be supervised by his/her research advisor and a Program Committee.

Program Committee
The Program Committee shall consist of at least three faculty, one of whom must be from outside the CE department or from outside the student's major area of study. The graduate research advisor generally serves as the chairman of the committee.

Capstone Experiences
Six graduate credits for thesis or three graduate credits for project are required as a part of the 30-hour requirement.

Thesis
M.S. Thesis or Research Project, see Capstone Experience.

Comprehensive Examination
Each student is required to make an oral presentation of his/her thesis or project and defend the thesis or project before his/her committee.

Research Opportunity/Experience
Students in civil engineering enjoy a curriculum with opportunities for interdisciplinary research, study abroad, and active participation in a growing research program. Programs of study can be tailored to suit individual needs and interests. The CE web site (http://www.ce.uncc.edu/) provides current areas of research conducted by the civil engineering faculty.

COOPERATIVE Ph.D. PROGRAM in ENGINEERING

The College of Engineering at UNC Charlotte has a cooperative arrangement with North Carolina State University (NCSU) to provide Ph.D. degree candidates located in Charlotte and enrolled in the Ph.D. program at NCSU with the opportunity to carry out most of their course work and dissertation research at UNC Charlotte. In addition to courses available at UNC Charlotte, selected doctoral-level courses from other participating institutions are available via the NC-REN telecommunications network.

Additional Admission Requirements
Requirements for admission to the cooperative Ph.D. program are:

1) The student must have previously earned a master's degree in engineering at UNC Charlotte or another accredited university.
2) The student must be accepted by a department in the UNC Charlotte College of Engineering.
3) The student must be accepted by the UNC Charlotte Graduate School.
4) The student's academic interests must parallel those of a UNC Charlotte faculty member who has been appointed to the NCSU graduate faculty or who is deemed eligible for such appointment.
5) The student must be sponsored and recommended for admission to the NCSU Ph.D. program by the department in which he or she has been accepted at UNC Charlotte. The student must be accepted by the NCSU Graduate School and the corresponding engineering department at NCSU. This acceptance by both UNCC and NCSU constitutes admission to the Ph.D. program which normally should be completed within the second semester of work beyond the master's degree.

Degree Requirements
The degree of Doctor of Philosophy is to be awarded by NCSU to students who have accrued expanded knowledge beyond the master's degree and have demonstrated the capability to undertake and accomplish significant research in a specialty area with a minimum of supervision. The specific degree requirements are available from the appropriate department at North Carolina State University.

COURSES IN CIVIL ENGINEERING

CEGR 5090. Special Topics in Civil Engineering. (1-4) Study of specific new areas emerging in the various fields of civil engineering. May be repeated for credit. *(On demand)*

CEGR 5108. Finite Element Analysis and Applications. (3) Prerequisite: consent of department. Finite element method and its application to engineering problems. Application of displacement method to plane stress, plane strain, plate bending and axisymmetrical bodies. Topics include but are not limited to dynamics, fluid mechanics, and structural mechanics. (Dual-listed with MEGR 5108.) *(Spring)*

CEGR 5121. Prestressed Concrete Design. (3) Prerequisites: CEGR 3225 and 4224 or consent of the department. Analysis and design of prestressed components and systems, including materials and systems for prestressing, loss of prestress, flexural and shear design in accordance with current building codes, analysis of indeterminate prestressed systems, and control of camber, deflection and cracking. *(Spring) (Alternate years)*

CEGR 5123. Bridge Design. (3) Prerequisites: CEGR 3221 and 3225, or consent of the department. Review of bridge design codes and loadings; superstructure and substructure design of short, intermediate, and long span bridges constructed of steel and concrete; earthquake design; segmental and cable-stayed bridges. *(Spring) (Alternate years)*

CEGR 5124. Masonry Design. (3) Prerequisites: CEGR 3225 or consent of the department. Introduction of masonry materials and engineering and materials properties and testing procedures. Design of reinforced and unreinforced masonry (clay and concrete) walls, beams, and columns for vertical, wind, and seismic loads. Analysis and design of masonry structures (including torsion) and introduction to computer applications. *(Spring) (Alternate years)*

CEGR 5128. Matrix Methods of Structural Analysis. (3) Prerequisite: consent of department. Derivation of

the basic equations governing linear structural systems. Application of stiffness and flexibility methods to trusses and frames. Solution techniques utilizing digital computer. *(Fall) (Alternate years)*

CEGR 5141. Process Engineering. (3) Prerequisite: CEGR 3141 or consent of the department. Applications of material and energy balance principles to the study of chemical, biological and environmental engineering processes. Overview of applied biotechnology, engineering thermodynamics and kinetics. *(Fall)*

CEGR 5142. Water/Wastewater Engineering. (3) Prerequisite: CEGR 3141or consent of the department. Analysis and design of water and wastewater treatment processes including: physical, chemical and biological treatment. Computer-aided design of treatment systems. *(Spring)*

CEGR 5143. Solid Waste Management. (3) Prerequisite: CEGR 3141 or consent of the department. Solid waste management, sources, generation rates, processing and handling, disposal, recycling, landfill closures, and remedial actions for abandoned waste sites. *(Spring) (Alternate years)*

CEGR 5144. Engineering Hydrology. (3) Prerequisite: consent of the department. A quantitative study of the various components of the water cycle, including precipitation, runoff, ground water flow, evaporation and transpiration, stream flow. Hydrograph analysis, flood routing, frequency and duration, reservoir design, computer applications. *(On demand)*

CEGR 5145. Groundwater Resources Engineering. (3) Prerequisite: CEGR 3141 or consent of the department. Overview of hydrological cycle. Principles of groundwater flow and well hydraulics. Regional groundwater flow and flow nets. Water chemistry and contamination. Applications of groundwater modeling. *(Fall) (Alternate years)*

CEGR 5146. Advanced Engineering Hydraulics. (3) Prerequisite: CEGR 3143 or consent of the department. Problems of liquids as applied in civil engineering; open channel flow; dams and spillways; water power; river flow and backwater curves; pipe networks, fire flow, sewage collection, groundwater, computer applications. *(On demand)*

CEGR 5161. Advanced Traffic Engineering. (3) Prerequisite: CEGR 3161 or consent of the department. Analysis of basic characteristics of drivers, vehicles and roadway that affect the performance of road systems. Stream flow elements, volume, density, speed. Techniques of traffic engineering measurements, investigations and data analysis, capacity analysis. Intersections, accidents, parking. *(On demand)*

CEGR 5162. Transportation Planning. (3) Prerequisite: CEGR 3161 or consent of the department. Urban transportation; travel characteristics of urban transportation systems; analysis of transportation-oriented studies; analytic methods of traffic generation, distribution, modal split and assignment; traffic flow theory. *(On demand)*

CEGR 5171. Urban Public Transportation. (3) Prerequisite: CEGR 3161 or consent of the department. Planning, design, and operation of bus, rail, and other public modes. Relationship between particular modes and characteristics of urban areas. Funding, security and other administrative issues. *(Fall) (Alternate years)*

CEGR 5181. Human Factors in Traffic Engineering. (3) Prerequisite: CEGR 3161 or consent of the department. Study of the driver's and pedestrian's relationship with the traffic system, including roadway, vehicle and environment. Consideration of the driving task, driver and pedestrian characteristics, performance and limitations with regard to traffic facility design and operation. *(On demand)*

CEGR 5182. Transportation Environmental Assessment. (3) A study of the environmental impact analysis and assessment procedures for transportation improvements. Route location decisions. Noise, air quality, socio-economic, and other impacts. *(On demand)*

CEGR 5183. Traffic Engineering Studies. (3) Prerequisite: CEGR 3161 or consent of department. Introduction to the traffic engineering studies most used by traffic engineers including data collection techniques, statistical analysis procedures, report writing and presentation. One hour of lecture and three hours of laboratory per week. *(On demand)*

CEGR 5184. Highway Safety. (3) Prerequisite: CEGR 3161 or consent of the department. Engineering responses at the state and local levels to the problem of highway safety. Extent of the highway safety problem, elements of traffic accidents, common accident countermeasures, collection and analysis of accident data, evaluation of safety-related projects and programs, and litigation issues. *(Fall) (Alternate years)*

CEGR 5185. Geometric Design of Highways. (3) Prerequisite: CEGR 3152 or consent of the department. Theory and practice of geometric design of highways including intersections, interchanges, parking and drainage facilities. Driver ability, vehicle performance, safety and economics are considered. Two hours of lecture and three laboratory hours per week. *(On demand)*

CEGR 5222. Structural Steel Design II. (3) Prerequisite: CEGR 3221. Analysis and design of structural steel components and systems with emphasis on theories necessary for a thorough understanding of the design of complete structures. Compression members

affected by local buckling, beams with lateral-torsional buckling, continuous beams and beam columns are covered. Welded and bolted connections. Current AISC Specifications used. *(Spring)*

CEGR 5224. Advanced Structural Analysis. (3) Prerequisite: CEGR 3122 or consent of the department. A continuation of CEGR 3122. Methods to determine deflections in structural members, including moment area, conjugate beam, virtual work, and Castigliano's theorem. Methods to analyze statically indeterminate structures, including approximate force, slope deflection, moment distribution, and matrix stiffness methods. Project to compare analysis techniques and introduce use of structural analysis computer programs. *(Fall)*

CEGR 5226. Reinforced Concrete Design II. (3) Prerequisite: CEGR 3225 or consent of the department. Analysis and design of reinforced concrete components and systems with emphasis on the fundamental theories necessary for a thorough understanding of concrete structures. Concentrically loaded slender columns, slender columns under compression plus bending. Wall footings and column footings. Analysis of continuous beams and frames. Total design project involving the analysis and design of a concrete structure. Current ACI Specifications used. *(Spring)*

CEGR 5234. Hazardous Waste Management. (3) Prerequisite: CEGR 3141 or consent of the department. Integration of scientific and engineering principles with legislation, regulation and technology in the management of hazardous wastes. Study of thermal, chemical, physical and biological systems and processes used in the treatment of hazardous wastes and the remediation of hazardous waste sites. *(On demand)*

CEGR 5235. Industrial Pollution Control. (3) Prerequisite: consent of the department. Source and characterization of industrial wastewaters. Fundamentals of chemical and physical treatment processes. Biological treatment technologies. Waste minimization and reduction technologies. Sludge handling and toxicity reduction. Implementation of field or laboratory treatability study. *(Fall) (Alternate years)*

CEGR 5236. Watershed Analysis. (3) Prerequisite: consent of the department. Study of NPS problems in urban and non-urban watersheds and from highway runoff. Estimate of sediment yield and design of BMP's including sediment control structures. Introduction to monitoring and modeling of hydrologic systems. Watershed modeling in a GIS environment. *(Spring) (Alternate years)*

CEGR 5237. Environmental Risk Management. (3) Prerequisite: consent of the department. Review of legislation and requirements pertaining to spills and releases of chemicals to the environment. Fundamentals of fires, explosions, toxic emissions and dispersion, hazardous spills, and other accidents. Study of techniques for accident prevention and spill control, and hazardous and risk assessment. *(Fall) (Alternate years)*

CEGR 5241. Chemical Processes in Water and Wastewater Treatment. (3) Prerequisites: CHEM 1252 (Formerly CHEM 1102) and CEGR 3141, or consent of the department. Chemical principles involved in the treatment of water and wastewaters; principles of chemical equilibrium relevant to natural water systems; the nature and effect of chemical interactions of domestic and industrial waste effluents on natural water systems. *(On demand)*

CEGR 5243. Topics in Environmental Health. (3) Prerequisites: CEGR 3141 and 4142, or consent of the department. Study of contemporary environmental health problems and practices as they relate to groundwater pollution, food and water-borne diseases, radiological health, occupational health and risk assessment. Provides an introduction to epidemiology and toxicology, and a historical review of federal environmental policy and legislative action. *(On demand)*

CEGR 5262. Traffic Engineering. (3) Prerequisite: CEGR 3161 or consent of the department. Operation and management of street and highway systems. Traffic control systems, traffic flow theory, and highway capacity. Evaluation of traffic engineering alternatives and the conduct of traffic engineering studies. *(Spring)*

CEGR 5264. Landfill Design and Site Remediation. (3) Prerequisites: CEGR 3258 and 3278, or consent of the department. Principles of waste disposal and sanitary landfill siting including design, construction, operation and maintenance. Site assessment of underground storage tank leaks; site remediation, and clean up technologies using choice and economic analysis and computer applications. *(Spring) (Alternate years)*

CEGR 5270. Earth Pressures and Retaining Structures. (3) Prerequisites: CEGR 3122 and 3278 or consent of the department. Earth pressure theories, effects of wall friction and external loads (including earthquake); design of rigid retaining walls (including structural details); sheetpile wall design; soil reinforcement systems for retaining structures; computer applications. *(On demand)*

CEGR 5271. Pavement Design. (3) Prerequisites: CEGR 3161 and 3278, or consent of the department. Pavement design concepts and considerations; engineering properties of pavement materials including soils, bases, asphalt concrete, and portland cement concrete; design of flexible and rigid pavements including shoulders and drainage; computer applications for pavement analysis and design. *(On demand)*

CEGR 5272. Design with Geosynthetics. (3) Prerequisites: CEGR 3258 and 3278 or consent of the

department. Types and properties of geosynthetics. Designing with geosynthetics for filtration, separation, drainage, soil reinforcement, stabilization, containment, and erosion control. Computer applications in design. *(Fall) (Alternate years)*

CEGR 5278. Geotechnical Engineering II. (3) Prerequisites: CEGR 3258 and 3278, or consent of the department. Design of shallow and deep foundations, including structural considerations; lateral earth pressure theories; design of rigid and flexible earth retaining structures; advanced aspects of slope stability analysis; and computer applications. *(Fall)*

CEGR 5892. Individualized Study and Projects. (1-6) Prerequisites: consent of the department. Individual investigation and exposition of results. May be repeated for credit. *(On demand)*

CEGR 5991. Graduate Research in Civil Engineering. (1-4) Prerequisite: consent of the department. Independent study of a theoretical and/or experimental problem in a specialized area of civil engineering. May be repeated for credit. *(On demand)*

The 6000-level courses for advanced graduate courses

CEGR 6090. Special Topics in Civil Engineering. (1-6) Directed study of current topics of special interest. May be repeated for credit. *(On demand)*

CEGR 6122. Advanced Topics in Structural Steel. (3) Prerequisites: CEGR 4222 or consent of the department. Theory of plastic-behavior of steel structures; current topics in structural steel. *(On demand)*

CEGR 6126. Analysis of Plates and Shells. (3) Prerequisite: CEGR 4224, or consent of the department. Analysis of rectangular and circular plates using classical as well as numerical methods; orthotropic and continuous plates and plate buckling. Analysis of thin shells and shells of revolution with and without bending; membrane theory of cylindrical shells; symmetric and unsymmetric loading; pipes, tanks, and pressure vessels; computer applications. *(On demand)*

CEGR 6127. Fracture Mechanics and Fatigue. (3) Prerequisites: CEGR 3221 or consent of the department. Introduction to fracture mechanics and fatigue, including Griffith Theory, plan strain-stress conditions, critical stress intensity factors, factors influencing fracture toughness, fracture mechanics design principles, fatigue performance, and fatigue initiation and propagation. *(On demand)*

CEGR 6128. Structural Optimization. (3) Prerequisites: CEGR 4224, or consent of the department. Introduction to optimization concepts; reformulation of common structural analysis and design problems to an optimization format; optimization of constrained, unconstrained, linear, and nonlinear problems by classical and numerical techniques; and computer applications. *(On demand)*

CEGR 6129. Structural Dynamics. (3) Prerequisite: CEGR 3122 or consent of the department. Methods for dynamic analysis of single and multiple degree of freedom systems. Topics include free vibrations, dynamic response of simple structures under time dependent loads (e.g., harmonic, periodic, impulsive, general dynamic loading), support motion, frequency domain analysis, response spectra, earthquake engineering. *(On demand)*

CEGR 6141. Water Quality Modeling. (3) Prerequisite: consent of the department. Mathematical modeling of water quality in receiving streams including: generation of point and nonpoint sources of pollution; formulation of transport equations for contaminants in stream and estuarine water; and prediction of the fate, persistence and transformation of chemical pollutants in aquatic ecosystems. Computer model simulation and case studies. *(On demand)*

CEGR 6142. Bioenvironmental Engineering. (3) Prerequisites: CEGR 3141 or consent of the department. Theoretical principles and design of aerobic and anaerobic biological unit processes for renovating waters and wastewaters. Activated sludge, aerated and facultative lagoons, rotating biological contractors, trickling and anaerobic filters. *(On demand)*

CEGR 6143. Bioprocess Technology. (3) Prerequisites: CEGR 4141 and general microbiology, or consent of the department. Introduction to metabolic pathways, growth kinetics and reactor theories. Laboratory investigation of the operation, optimization and scale-up problems associated with batch and continuous culture of microorganisms. Process analysis and modeling of environmental engineering processes. *(Spring)*

CEGR 6144. Environmental Biotechnology. (3) Prerequisite: Consent of the department. Application of biotechnology to the management of environmental problems. Study of bioprocess principles, bioremediation of waste disposal sites, cell immobilization technology and innovative biotechnologies. *(On demand)*

CEGR 6145. Waste Incineration. (3) Prerequisite: consent of the department. Fundamentals of incineration of hazardous/solid wastes. Thermochemical applications and equipment design. Computer modeling of the incineration process and air quality control. *(Spring)*

CEGR 6146. Advanced Groundwater Analysis. (3) Prerequisite: Consent of the department. Modeling of groundwater flow in saturated and unsaturated zones. Contaminant transport including advection, dispersion and numerical modeling. Groundwater remediation technology. *(On demand)*

CEGR 6147. Storm Water Modeling. (3) Prerequisite: Consent of the department. Characterization of non point source pollution; modeling of flow and pollutant transport in storm runoff; application of U.S. EPA Stormwater Management Model and U.S. Soil Conservation Service Models. *(On demand)*

CEGR 6148. Water Conservation. (3) Prerequisites: Consent of the department. Principles and issues concerning water conservation and methods for effecting water conservation, including residential, industrial, commercial, and agricultural water conservation; water rates, audits and reuse/reclamation as they relate to water conservation; and case studies. *(On demand)*

CEGR 6161. Traffic Control and Operation. (3) Prerequisite: CEGR 5161 or consent of the department. Traffic control theory and application; traffic regulation, laws and ordinances; speed control, intersection control, flow control and parking control; design and application of control devices, investigation, evaluation techniques; statistical analysis; administration. *(On demand)*

CEGR 6165. Urban Systems Engineering. (3) Prerequisite: CEGR 3202 or consent of the department. Survey of economic, political, sociological and technological factors affecting modern growth; a planning process and its role in solving selected urban problems with emphasis on engineering contributions. *(On demand)*

CEGR 6171. Air Quality Control. (3) Prerequisite: consent of the department. Study of various types of air pollutants, their sources, nature and effects. Examination of air quality criteria, standards and monitoring. Analysis of feasibility, applicability and efficiency of diverse systems of control. Evaluation of goal and research needs in the future. *(On demand)*

CEGR 6172. Air Dispersion Modeling. (3) Prerequisites: Consent of the department. Atmospheric pollution problems, federal regulations, boundary layer meteorology, dispersion theory, gaussian model, plume rise formulas, air toxics, and computer modeling of point area, line and mobile sources. *(On demand)*

CEGR 6173. Environmental Aquatic Chemistry. (3) Prerequisite: CHEM 3111 or CHEM 3141, or equivalent, or consent of the department. Concepts of chemical equilibria applied to natural aquatic systems. Topics include acid-base reactions, buffer systems, mineral precipitation, coordinate chemistry, redox reactions, adsorption phenomena and chemical-equilibria computer programs. *(Spring) (Alternate years)*

CEGR 6181. Traffic Flow Theory. (3) Prerequisite: CEGR 5161 or consent of the department. Logical foundations and mathematical representation of traffic flow; interrelation between microscopic and macroscopic equations of motion for highway traffic; stochastic properties of traffic at low and moderate densities. Car-following theories of traffic flow at high densities. Applications of queuing theory. *(On demand)*

CEGR 6182. Transportation Systems Analysis. (3) Prerequisite: CEGR 5161 or consent of the department. Issues, concepts and methods of transportation systems engineering and planning. Decision making in transportation management. The application of analytical methods to the development and evaluation of transport systems. *(On demand)*

CEGR 6252. Soil Dynamics and Earthquake Engineering. (3) Prerequisites: CEGR 3122 and 3278, or consent of department. Review of the dynamics of single and multi degree of freedom systems. Earthquake mechanism, distribution, magnitude, intensity, ground shaking, site effects, prediction, and response spectra. Soil liquefaction; aseismic design of foundations; seismic codes; and machine foundation design. *(On demand)*

CEGR 6261. Traffic Signal Control Systems. (3) Prerequisite: CEGR 6161 or consent of the department. Study of control systems for isolated intersections, arterial streets, closed networks, and freeways. Emphasis on computer models; state-of-the-art detection, control, and communications equipment and software; and intelligent vehicle/highway systems. *(Fall)*

CEGR 6268. Advanced Soil Mechanics. (3) Prerequisites: CEGR 3258 and 3278, or consent of the department. One and two-dimensional consolidation, layered strata effects, and creep; seepage in layered strata, flow net, and seepage forces; shear strength parameters, effective and total stress paths, and application for slope stability evaluation; principles of critical state soil mechanics; computer applications. *(On demand)*

CEGR 6892. Individualized Study and Projects. (1-6) Individual investigation and exposition of results. May be repeated for credit. *(On demand)*

CEGR 6991. Graduate Master Thesis Research. (1-6) Individual investigation culminating in the preparation and presentation of a thesis. May be repeated for credit. *(On demand)*

CEGR 7999. Master's Degree Thesis Residence (1) Required for continuing registration and enrollment while completing thesis or research project. May be repeated. *(On demand)*

ELECTRICAL ENGINEERING

Masters and Ph.D. Programs

Department of Electrical and Computer Engineering

332 Smith Building
(704) 547-2302
http://www.ece.uncc.edu

Degrees

M.S.E.E, M.S.E, and Ph.D.

Coordinator

Dr. Rafic Z. Makki

Graduate Faculty

Falih H. Ahmad, Assistant Professor
Steve Bobbio, Professor
Robert Coleman, Professor
Teresa Dahlberg, Assistant Professor
Kasra Daneshvar, Professor
Michael Feldman, Associate Professor
Richard Greene, Professor
Mohamed-Ali Hasan, Associate Professor
Irvin R. Jones, Jr., Assistant Professor
Yogendra P. Kakad, Professor
Vasilije Lukic, Professor
Rafic Makki, Professor
Mehdi Miri, Associate Professor
Howard Phillips, Professor
Barry Sherlock, Associate Professor
William Smith, Professor Emeritus
Farid Tranjan, Professor
Raphael Tsu, Professor
Sheng-Guo Wang, Associate Professor
Tom Weldon, Assistant Professor

The department of Electrical and Computer Engineering offers multidisciplinary programs leading to M.S. and Ph.D. degrees in Electrical Engineering. The department offers a first class education to its students which prepares them for positions in industry or academia. Our students are provided with both breadth of knowledge in Electrical and Computer Engineering and related areas and depth of knowledge in the chosen research specialty. The department is staffed with a reputed multidisciplinary faculty conducting research in areas ranging from control systems to optoelectronics. A full range of state-of-the-art laboratories is available enabling faculty and students to conduct research at the cutting edge of technology.

MASTER'S PROGRAMS in ELECTRICAL ENGINEERING

M.S.E.E. and M.S.E. Degree Requirements
The M.S.E.E. degree is awarded to those students with a B.S.E.E. degree who complete the M.S. program in Electrical and Computer Engineering. The M.S.E. degree is awarded to those students with a bachelor's degree in a field other than Electrical and Computer Engineering who complete the M.S. program in Electrical and Computer Engineering. Normally, students entering the M.S.E. program are admitted conditionally and required to take undergraduate preparatory courses in Electrical and Computer Engineering.

Thesis

Both thesis and non-thesis options exist.

Degree Requirements for the Thesis Option

1) Plan of Study - the student must meet with his/her advisor to formulate a plan of study. The plan of study must be submitted after completing at least 9 but no more than 18 semester credits.
2) Satisfactory completion of 30 hours of approved graduate credits. At least 18 hours must be at the 6000 level. This includes:
    a) 24 hours in the major and related areas of specialty of which 6 hours must be outside of ECE department, and
    b) 6 hours of thesis.
3) Admission to candidacy - the admission to candidacy form must be completed prior to the thesis defense or oral examination. The student should consult the schedule of classes for deadlines on submitting this form for Fall or Spring graduation.
4) Thesis Defense - a copy of the thesis should be distributed to each member of the program committee at least one week prior to the defense.

Degree Requirements for the Non-Thesis Option

1) Plan of Study - the student must meet with his/her advisor to formulate a plan of study. The plan of study must be submitted after completing at least 9 but no more than 18 semester credits.
2) Satisfactory completion of 30 hours of approved graduate credits. This includes 21 hours of major (12 of which must be in ECE), minimum of 6 hours outside the department. Of the 30 credits at least 18 must be at the 6000 level.
3) Essay - this can take several forms. For example it could be a survey of a number of research papers, a report on a small development project that the student undertakes, etc. The essay topic will be assigned by the advisor. The final written report will be approved by the student's advisory committee (a

majority of the committee members) via signatures of the committee members on the report.
4) Admission to candidacy - the admission to candidacy form must be completed prior to the thesis defense or oral examination. The student should consult the schedule of classes for deadlines on submitting this form for Fall or Spring graduation.
5) Oral Exam - this will be administered by the program committee.

Program Committee
The program committee is composed of at least 3 members of the graduate faculty, one of which must be a member of a department other than ECE. The graduate program advisor generally serves as the chairman of the committee.

Ph.D. in ELECTRICAL ENGINEERING

Degree Requirements
The following is a chronologically ordered set of requirements for the Ph.D. degree in Electrical Engineering:
1) Appointment of a Ph.D. advisor and formation of an advisory committee.
2) Development of a Ph.D. Plan of Study detailing all course and examination requirements.
3) Successful completion of the written qualifying examination.
4) Presentation of a proposal for Ph.D. research and admission to candidacy.
5) Successful defense of the Ph.D. Dissertation.

Within the first semester of being admitted into a Ph.D. program, the student should choose a Ph.D. adviser and form an advisory committee. In conjunction with the Ph.D. adviser and this advisory committee, the student will develop a Plan of Study to meet the Ph.D. program requirements of course work and examinations and prepare to undertake original research leading to a dissertation of a quality that would be acceptable for publication of articles in peer-refereed professional journals.

Plan of Study
The Plan of Study must be submitted to the Chair of the Department for review and approval within the second semester after admission to the Ph.D. program. The Plan of Study must show a minimum of 72 hours of credit beyond the Baccalaureate degree, including at least 45 hours of formal course work beyond the baccalaureate degree and at least 18 hours of research/ dissertation credits (beyond the M.S. thesis credits). For students who do not possess appropriate bachelor's and/or master's degrees in engineering, additional course work will be expected.

Course Requirements
The specific course requirements will be set by the student's Advisory Committee and must include:
At least 30 hours within the major field of study, no less than 18 of which must be in courses at the 8000-level, open only to Ph.D. students.
Two minors consisting of at least 6 hours each in related fields of study.
Graduate Only Courses. At least 18 hours in the major field must be in courses at the 8000-level. At least 12 of those hours must be taken after admission to the Ph.D. program.

Grades
A student is expected to achieve A's or B's in all course work taken for graduate credit and must have a GPA of at least a 3.0 in order to graduate. The dissertation is graded on a Pass/ Unsatisfactory basis and, therefore, will not be included in the cumulative average. An accumulation of more than two marginal (C) grades will result in termination of the student's enrollment in the graduate program. If a student makes a grade of U on any course, enrollment will be terminated. A graduate student whose enrollment has been terminated because of grades is ineligible to attend any semester or summer session unless properly readmitted to the graduate program. Readmission to the program requires approval of the Dean of the Graduate School upon the recommendation of the student's major department and the Engineering Doctoral Graduate Committee of the College of Engineering.

Residence
A student may satisfy the residency requirement for the program by completing 18 hours, either course work or research credits, by study-in-residence during the academic year and during the summer terms, as long as the study is continuous. Study-in-residence is deemed to be continuous if the student is enrolled in one or more courses (including research/dissertation credit) in successive semesters until eighteen hours of credit are earned.

Qualifying Examination
In addition to demonstrating a high level of competence in course work, the student must pass a comprehensive written qualifying examination in the major and minor areas. The qualifying examination should be taken before completion of 18 hours beyond the master's degree in the major and minor areas but must be passed no later than one year after initial admission to the program. Failure to pass the qualifying examination in two tries will result in the termination of the student's enrollment in the Ph.D. program.

Ph.D. Qualifying Examination Format

The qualifying exam is divided into two test sessions. The first session covers primarily senior level courses, and the second session covers primarily first-year graduate courses in ECE.

In each session, the student chooses four problems only from a set of problems covering different areas. In session 1, a maximum of two problems can be selected from a given area. In session two, at least one problem must be chosen from the minor course listing which is external to the ECE department (note minors can be within or outside ECE but at least one must be outside ECE). For a detailed listing of courses and areas, visit the ECE Department WWW site at "www.ece.uncc.edu."

Dissertation Proposal and Admission to Candidacy

Because the Ph.D. program is heavily based on independent research, each student must write a proposal describing his/her proposed dissertation research following the technical guidelines established by the department. The proposal must be presented to and orally defended before the student's advisory committee. The proposal must be presented within one year after the qualifying examination is passed. Upon approval of the student's dissertation proposal, the advisory committee will recommend the student's admission to candidacy subject to the approval of the engineering Doctoral Graduate Committee and the Dean of the Graduate School.

Dissertation

Evidence of a high degree of competence in scholarship, written exposition, independent inquiry and the ability to organize and apply knowledge must be demonstrated by the student in the dissertation. The student will make a public defense of the dissertation at which time the dissertation, as well as the student's knowledge of the field, will be appropriate matter for examination by the student's advisory committee. Although questions may be asked by the general audience, evaluation of the dissertation defense is the sole responsibility of the advisory committee. The dissertation will be graded on a Pass/Unsatisfactory basis.

Research Tool Requirements

Each student is expected to develop working knowledge of the library tools used in literature search and review in the major field of concentration. This would include familiarity with at least one of the computer-based databases available at UNC Charlotte. In addition, each student is expected to have a working knowledge of at least one computer language appropriate for the field of inquiry. The student will have a working knowledge of appropriate major software packages and will have the ability to develop original software as needed.

Time Limit

Students are allowed a maximum of eight (8) calendar years from formal admission to the Ph.D. program to complete the program successfully.

Tuition Waivers

For exceptionally qualified candidates, in state tuition and out-of-state tuition differential waivers are available.

Assistantships

Teaching Assistantships are awarded for exceptional students. Application forms are available on the ECE Web site or can be obtained from the department office.

Courses in Electrical and Computer Engineering

ECGR 5090. **Special Topics.** (1-6) Directed study of current topics of special interest. May be repeated for credit. *(On demand)*

ECGR 5101. **Advanced Computer Utilization.** (3) Prerequisite: consent of department. The use of computers in large scale engineering problems. Topics include flow diagrams, matrix analysis of systems, applications of iteration methods to non-linear problems, eigen-value problems, optimization and handling of large engineering database problems. Engineering applications will be emphasized. *(On demand)*

ECGR 5102. **Engineering Simulation.** (3) Prerequisite: ECGR 2103 or consent of department. A wide range of simulation related topics will be introduced including the theory of simulation, characteristics of simulators, and trade-offs in simulation studies. Continuous and discrete simulation with primary emphasis on application of simulation techniques to engineering problems. Simulation of actual problems based on students' interest and experience areas. *(On demand)*

ECGR 5103. **Applied Computer Graphics.** (3) Prerequisite: permission of department. Interactive graphics; raster, character, vector, graphics, display technologies; rotation, scaling, translating of graphics image; image processing/enhancement; feature extraction; 3-D graphics; hidden lines. *(On demand)*

ECGR 5104. **Computational Methods in Power Systems.** (3) Prerequisite: ECGR 4142 or consent of department. Numerical techniques for analysis, operation and planning of power systems. Sparse matrix techniques applied to power flow algorithms. Economic operation of power systems. Optimum power flow. *(On demand)*

ECGR 5111. **Control Systems.** (3) Prerequisite: consent of department. Mathematical models and characteristics of control systems. Performance and

stability of linear feedback systems. Root locus and frequency response techniques. Stability in frequency domain. Time domain analysis. Design and compensation of control systems. Credit will not be given for ECGR 5111 where credit has been given for ECGR 4111. *(Fall) (Evenings)*

ECGR 5112. Nonlinear Analysis. (3) Prerequisite: ECGR 3111. Solution of nonlinear problems using numerical and graphical methods, phase plane plots, analysis of singular points and analytical techniques. Forced oscillating systems. Stability of nonlinear systems. Use of analog and digital computer to study nonlinear problems. *(On demand)*

ECGR 5113. Network Synthesis. (3) Prerequisite: ECGR 4114. The positive real concept, properties and methods of testing. Realizability conditions on driving point functions. Methods of synthesis of one-port. Physical realizability and properties of two-port networks. Transfer function synthesis. Approximation methods. *(On demand)*

ECGR 5114. Device Characterization, Parameterization and Modeling. (3) Prerequisite: ECGR 3132 and ESGR 4134 or permission of department. Advance device and circuit analysis; device and circuit simulation using SPICE, ECAP or equivalent. Parametric modeling of active devices. Device characterization and parameterization; temperature effects; thermal cycling. Analysis of device failure modes. *(On demand)*

ECGR 5121. Antennas. (3) Prerequisite: ECGR 3122 with a grade of C or better or permission of the department. Radiation into free space, the point source, thin linear antenna, arrays of linear elements, aperture antennas, impedance, methods of feeding, matching and termination. Antenna systems. *(On demand)*

ECGR 5122. Random Processes and Optimum Filtering. (3) Prerequisites: ECGR 3111 and STAT 3228 or permission of department. Review of probability, univariate and multivariate distribution functions; random processes, discrete and continuous time processes, widesense stationary, ergodicity; time-and frequency-domain analysis; linear systems, optimum filtering, Wiener filters, Kalman filters; application. (Spring)

ECGR 5123. Advanced Electromagnetic Field Theory. (3) Prerequisite: ECGR 3122 or permission of department. Maxwell's equations and propagation. Properties of guided and surface waves. Wave properties of light; physical and fiber optics. *(On demand)*

ECGR 5124. Digital Signal Processing. (3) Prerequisite: EEGR 3112 with a grade of C or better. Sampling and signal recovery in linear systems; analysis of sampled systems; discrete and fast Fourier transforms; z-transform; discrete convolution; design of digital FIR and IIR filters. *(Spring)*

ECGR 5125. Optical Signals and Networks. (3) Prerequisites: ECGR 3122 and PHYS 2241 or permission of department. The engineering aspects and applications of modern optics. Optical communications, optical signal and data processing, principles of integrated optics. Fiber optical communications. Fast-Fourier transforms and diffraction theory applied to computed holography, computed tomography, and optical processing. *(On demand)*

ECGR 5132. Advanced Analog Integrated Circuit Electronics. (3) Prerequisite: consent of department. Topics include analog amplifier design, layout and simulation of analog circuits, active filters, analog processing, process control, electronic power supplies, reliability, noise and low-level signal processing. *(On demand)*

ECGR 5133. VLSI Systems Design. (3) Prerequisite: ECGR 2181 and 3131 or permission of department. Analysis, design, and synthesis of very large scale integrated circuits. A project-oriented course relying heavily on computer-aided design tools for logic, layout design, and simulation. *(Fall) (Evenings)*

ECGR 5134. Advanced VLSI Systems Design. (3) Prerequisite: ECGR 5133. A project-oriented course dealing with advanced topics in VLSI systems design and analysis such as circuit design techniques, array structures, performance estimation, automated routing and device electronics. *(Spring)*

ECGR 5135. Physical Electronics. (3) Prerequisite: ECGR 3122 or PHYS 3181 or permission of department. Dynamics of charged particles; electron motion in electromagnetic fields; types of electron emission; beam focusing; longitudinal and transverse beam waves; microwave generation; plasma parameters. *(On demand)*

ECGR 5137. Device Electronics for Integrated Circuits. (3) Prerequisites: ECGR 3132 and ESGR 4134, or permission of department. The basic operating principles of electronic devices in integrated circuits are treated. The physical models of these devices are discussed. Graduate students are required to carry out laboratory experimentation. *(Fall) (Evenings)*

ECGR 5138. Electronic Thin Film Materials and Devices. (3) Prerequisite: ECGR 4133 or 3132, or permission of the department. Applications of thin films in microelectronics/optoelectronics manufacturing processes; vacuum technology, deposition techniques, and the characterization methods relevant to optoelectronic applications; thin film applications such as metallization, silicide formation, light emitting diodes (LED) and lasers, and doping of semiconductors. *(Fall)*

ECGR 5139. Digital Communication Systems. (3) Prerequisites: ECGR 2181 and 3131. Topics include digital data transmission systems, signal and system representation, digital system performance characterization, pulse code modulation, and statistical communications theory. *(On demand)*

ECGR 5140. Introduction to VLSI Processing. (3) Prerequisite: permission of the department. Microelectronic fabrication; relevant materials, processes, and tools; fabrication of a simple structure in the VLSI clean room/lab. *(Fall)*

ECGR 5141. Unsymmetrical Analysis of Power Systems. (3) Prerequisite: ECGR 4142 or consent of department. Application of symmetrical components to the calculation of overcurrents and overvoltages during unsymmetrical faults. Characterization of generators, transformer banks and transmission lines for unsymmetrical analysis. Methods for grounding the system neutral. *(On demand)*

ECGR 5142. Power Generation: Operation and Control. (3) Prerequisite: ECGR 4142 or consent of department. Characteristics of power generation units, steam, nuclear reactor and hydroelectric. Economic and thermal system dispatch. Transmission losses, load flow problems. Hydro scheduling, hydro-plant models. Energy production cost models. Interchange evaluation. *(Fall) (Alternate years) (Evenings)*

ECGR 5143. Dynamic and Transient Analysis of Power Systems. (3) Prerequisite: ECGR 4142 or permission of department. Large-scale systems state descriptions and hierarchical control. State space models, dynamic stability and testing. Stability of simple and multi-machine systems. Transient phenomena in electrical power systems. Transient stability problem. *(Spring) (Alternate years) (Evenings)*

ECGR 5146. Introduction to VHDL. (3) Prerequisites: ECGR 2182 and knowledge of a computer language, or permission of department. Introduction to VHSIC Hardware Description Language (VHDL) including VHDL-based high-level design of microelectronic systems, VHDL programming, and VHDL synthesis; emphasis on learning and using industry-standard VHDL tools running on VNIX workstations. *(Fall)*

ECGR 5161. Control of Robotic Manipulators. (3) Prerequisites: ECGR 4161 and 4111. Control of industrial robots including linear, nonlinear, and adaptive control of robot's motion plus control of forces and torques exerted by the end-effector. Additional topics include computer animation of the controlled behavior of industrial robots, actuator and sensor types, robot vision, and control computer/robot interfacing (dual-listed with MEGR 5128). *(Spring)*

ECGR 5165. Laser Electronics. (3) Prerequisites: ECGR 3122 and PHYS 2241 or permission of department. Laser oscillation, excitation, amplification, dispersion, absorption, basic principles of quantum electronics, and general characteristics of lasers. Semiconductor lasers switching and modulation, photovoltaic and photodetectors. Ray tracing in an optical system, Gaussian beams in continuous media, and nonlinear optics, CW and pulsed lasers, Q-switching, mode locking, electrical and opto-electronic engineering aspects of laser technology. Basic spectroscopy, applications to semiconductor fabrication, and surface processing. *(On demand)*

ECGR 5181. Computer Arithmetic. (3) Prerequisite: permission of department. Principles, architecture and design of fast two operand adders, multi-operand adders, standard multipliers and dividers. Cellular array multipliers and dividers. Floating point processes, BCD and excess three adders, multipliers and dividers. *(On demand)*

ECGR 5182. Digital System Testing. (3) Prerequisite: ECGR 2181 with a grade of *C* or better or permission of department. System testing; Boolean difference; D-algorithm; checking experiments; redundancy, computer-aided digital test systems. *(Spring)*

ECGR 5187. Data Communications. (3) Prerequisite: consent of department. Principles of data communication; computer communications architecture (layering) with emphasis on the physical layer and data link layer, transmission media; analog and digital signal representation; data transmission basics; Shannon's theorem; error detection/correction; data compression; point-to-point protocols; multiplexing. *(Fall)*

ECGR 5188. Modeling and Analysis of Dynamic Systems. (3) Prerequisite: ECGR 3111 or permission of the department. Models and dynamical properties of mechanical, thermal, and fluid systems, utilizing by analogy the properties of electrical circuit theory. Emphasis on the formulation of circuit models and the development of terminal equations of system components. Dynamic response to step, pulse, and sinusoidal driving functions using Laplace transforms. Sinusoidal steady-state and frequency response of systems. *(On demand)*

ECGR 5190. Acoustics. (3) Prerequisite: ECGR 3122 or PHYS 4231. Vibrations and simple vibrating systems; radiating systems; plane waves of sound; dynamic analogies, microphones and other acoustic transducers; acoustic measurements. *(On demand)*

ECGR 5191. Analog and Digital Communication. (3) Prerequisite: ECGR 3111. Analysis and transmission of signals including analog communication systems (amplitude and frequency modulation, effect of noise); digital communications systems (pulse code modulation,

data transmission systems phase-shift keying and frequency-shift keying, effect of noise), *(Fall) (Evenings)*

ECGR 5192. Solid State Microelectronics II. (3) Prerequisites: ECGR 3122 and 4133 each with a grade of C or better. Advanced device concepts for MOSFET, bipolar, and CMOS integrated circuits. Gate length, transit time, and power-frequency limits. Device scaling concepts. Tunneling and avalanche devices, and hot electron behavior. Device and interconnect reliability and failure and device interconnects. Submicron channel, MODFET, and quantum well devices. High frequency solid state devices. Limits of switching speed. Solid state power devices. *(Spring)*

ECGR 5193. Power System Analysis I. (3) Prerequisite: ECGR 3142 with a grade of C or better. Representation of power system components for analysis studies. Transmission line parameters. Network equations. Load flow analysis and numerical methods. *(Fall)*

ECGR 5194. Power System Analysis II. (3) Prerequisite: ECGR 4141 with a grade of C or better. Economic operation of power systems. Short circuit studies. Symmetrical components. Transient stability analysis. *(Spring)*

ECGR 5195. Electrical Machinery. (3) Prerequisite: ECGR 3142 with a grade of C or better. Advanced theory of transformers and rotating. Machines; harmonic and saturation effects on machine performance. Unbalanced operation and transient conditions. *(On demand)*

ECGR 5196. Introduction To Robotics. (3) Prerequisites: ECGR 2103 or MEGR 2101 and senior standing. Modeling of industrial robots including homogeneous transformations, kinematics, velocities, static forces, dynamics, computer animation of dynamic models, motion trajectory planning, and introduction to vision, sensors and actuators (dual-listed with MEGR 4127). *(Fall)*

ECGR 5197. Fundamentals of Optical Engineering. (3) Prerequisites: ECGR 3122 and PHYS 2241 or permission of the department. The engineering aspects and applications of modern optics. Optical communications, optical signal and data processing, principles of integrated optics. Fiber optical communications. Fast-Fourier transforms and diffraction theory applied to computed holography, computer tomography and optical processing. *(On demand)*

ECGR 5231. Materials for Electro-Optical Engineering. (3) Prerequisite: ECGR 4125 or permission of department. Methods of processing, growth, and device structuring for electro-optical and optical engineering; crystalline, polycrystalline, ceramic, glass, and polymer synthesid and processing to produce desire optical properties for magneto-optical devices and their use in electronic memories; synthesis, drawing, cladding, coupling, and dopling of optical fiber devices. *(Fall)*

ECGR 5261. Microwave Circuit Design I. (3) Prerequisites: ECGR 3131 and graduate standing, or permission of department. Design and analysis of microwave devices and circuits; including microwave aspects of discrete active (i.e., field effect and bipolar transistors, etc.) and passive (i.e., microstrips, inductors, capacitors) components; device parameter extraction, using computer aided design (CAD) tools. *(Fall)*

ECGR 5265. Microwave Devices and Electronics. (3) Prerequisites: ECGR 3122 and PHYS 2231 with grades of C or better or permission of department. Microwave transmission line theory, parameters, microwave waveguides, microstrip line and components including resonators, slow-wave structures, tees, rings, couplers, circulators, isolators, and microwave tubes. Microwave solid state electronics including microwave transistors, tunnel diodes, transferred electron devices, avalanche transit-time devices, and mono-lattice microwave integrated circuits. *(On demand)*

ECGR 5411. Control Systems Theory I. (3) Prerequisite: ECGR 3111 with a grade of C or better. Transfer functions, block diagrams and signal flow graphs. Feedback control system characteristics. The performance and stability of feedback systems using root locus and frequency response methods. Time domain analysis of control systems. The design and compensation of control systems. *(Fall)*

ECGR 5412. Control Systems Theory II. (3) Prerequisite: ECGR 4111 with a grade of C or better. State space techniques and useful state space methods. System stability. Controllability and observability of linear systems. The formulation of the state equations for discrete-time systems and the analysis of these systems by matrices. Analysis of nonlinear systems. Optimal control systems studies. *(Spring)*

ECGR 5431. Linear Integrated Electronics. (3) Prerequisite: ECGR 3132 with a grade of C or better. Design of linear integrated circuits utilizing bipolar and MOS devices. Application in linear amplifier design, control and processing of analog signals. Power supply regulators, analog switches, and active filters. *(Fall)*

ECGR 5892. Individualized Study. (1-6) Individual investigation and exposition of results. May be repeated for credit. *(On demand)*

ECGR 6021. Advanced Topics in EM and Applications. (3) Prerequisite: permission of department. Possible topics include: advanced boundary value problems; nonlinear magnetic materials; wave guides and resonant cavities; magnetohydrodynamics and

plasmas; relativistic effects; charged particle dynamics; radiation. *(On demand)*

ECGR 6090. Special Topics. (1-6) Directed study of current topics of special interest. May be repeated for credit. *(On demand)*

ECGR 6101. Advanced Computer Graphics. (3) Prerequisites: ECGR 5103 and 5133 or permission of department. A project-oriented course using and developing techniques of CAD/CAM graphics, hardware and software development. Advanced application of graphics in computer-aided systems design. *(On demand)*

ECGR 6102. Optimization of Engineering Designs. (3) Prerequisite: ECGR 5101 or consent of department. The development of computationally feasible algorithms for solving optimization problems in engineering designs. Introduction to non-linear programming methods; study of constrained and unconstrained problems, linear programming problems and other related topics. *(On demand)*

ECGR 6111. Systems Theory. (3) Prerequisite: ECGR 4112 or consent of department. State space concepts and solutions. Introduction to theory of deterministic linear systems. Application of matrix methods and vector difference equations to lumped parameter electrical mechanical and fluid systems, and discrete time systems. Frequency domain techniques in signal and systems analysis. Computer simulation of system dynamics. *(Fall) (Evenings)*

ECGR 6112. Digital Control Systems. (3) Prerequisites: ECGR 6111 and 4181 or consent of department. Time-domain and Z-domain analysis of linear discrete systems, open and closed loop sampled data systems, engineering characteristics of computer control systems, simulation of system dynamics. *(Spring, Alternate years)*

ECGR 6114. Digital Signal Processing II. (3) Prerequisite: permission of department. Discrete Hilbert Transforms, discrete random signals, effect of finite register length in digital and signal processing, speech processing, radar and other applications. *(Spring, Alternate years) (Evenings)*

ECGR 6115. Optimal Control Theory I. (3) Prerequisite: ECGR 6111 or permission of department. Optimum control of continuous-time and discrete time systems. The Maximum Principle and Hamilton Jacobi Theory. Theory of optimal regulator, state estimation and Kalman Bucy Filter. Combined estimation and control--the Linear Quadratic Gaussian Problems. Computational methods in optimum control systems. *(Fall, Alternate years) (Evenings)*

ECGR 6116. Optimal Control Theory II. (3) Prerequisite: ECGR 6115 or permission of department. A continuation of ECGR 6115 with emphasis on stochastic systems. Optimal filtering. Discrete-time Kalman filter and Kalman filter properties. Parameter identification. Multi-variable control systems, system sensitivity and robustness. *(Spring, Alternate years) (Evenings)*

ECGR 6117. Multivariable Controls. (3) Prerequisites: ECGR 6111. Problem of robustness controls, emphasizing computer-oriented approaches; high infinity and algebraic methods current developments. *(On demand)*

ECGR 6118. Applied Digital Image Processing. (3) Cross-listed with CSCI 6134. Digital image fundamentals; comparison of image transforms including Fourier, Walsh, Hadamard and Cosine; image data compression techniques; image enhancement algorithms; image restoration; image encoding process; image segmentation and description; relationship of hardware restrictions to image fidelity. *(On demand)*

ECGR 6121. Advanced Theory of Communications I. (3) Prerequisite: introductory probability course or permission of department. Statistical communications theory and modern communications systems emphasizing modulation and methods of taking into account the effects of noise on various systems. *(Fall, Alternate years) (Evenings)*

ECGR 6122. Advanced Theory of Communications II. (3) Prerequisite: ECGR 6121 or permission of department. Continuation of ECGR 6121 including coding and decoding methods. Wave form communications. Applications. *(Spring, Alternate years) (Evenings)*

ECGR 6125. Optoelectronic Information Processing. (3) Prerequisite: ECGR 5125 with a grade of *B* or better or permission of department. Spatial light modulation including magneto-optic and electro-optic light modulators, optical bistable devices and logic gates, optical processing components such as array detectors and Charge Couple Devices (CCD), multiple-value logic, systolic processors and optical logic arrays, symbolic computing, optical interconnects, holographic elements and artificial intelligence, optical implementation of neural computers. *(Spring)*

ECGR 6127. Medical Ultrasonics. (3) Prerequisite: ECGR 3122 or PHYS 4231 with grade of C or better, or permission of department. Acoustic wave propagation in fluids and solids, acoustic impedances, acoustic radiators and beam profiles; piezoelectricity, piezoelectric ceramics and polymers, integrated ultrasound transducers, design and testing of medical ultrasound transducers; hyperthermia, imaging, tissue characterization. *(Spring)*

ECGR 6131. Hybrid Microelectronics. (3) Prerequisite: ECGR 5132 or permission of department. A project-oriented course involving design, bonding, interconnect and testing of a multidie hybrid

microelectronics circuit. Emphasis placed upon use of I.C.'s of various technologies in these designs to optimize performance. *(On demand)*

ECGR 6132. Advanced Semiconductor Device Physics. (3) Prerequisite: ECGR 5137 or permission of department. A review of semiconductor physics, bipolar and unipolar devices, photonic devices and methods of measuring specific device characteristics. *(Spring)*

ECGR 6133. MOS Physics and Technology. (3) Prerequisite: ECGR 6132 or permission of the instructor. The theoretical and practical aspects of the metal oxide semiconductor (MOS) system, its electrical properties, and the measurement and the technology for their control. These topics are developed from simple beginnings to the current state of the art. *(Fall)*

ECGR 6138. Physical Design of VSLI Systems. (3) Prerequisite: ECGR 5133 or equivalent. Synthesis and design of high-speed VLSI circuits; state-of-the-art approaches for circuit simulation; models and techniques for VLSI physical design. *(Spring)*

ECGR 6141. Power System Relaying. (3) Prerequisite: ECGR 5141 or permission of department. Function and principles of protective relaying instrument transformers. Directional, distance and differential relays. Protection of generators, transformers, and transmission lines. Ground fault protection. Computer relaying, algorithms for protective relaying. *(On demand)*

ECGR 6142. Voltage Transients and Surge Protection. (3) Prerequisite: ECGR 5141 or permission of department. Overvoltages due to lightning and switching surges. Traveling waves on transmission lines. Surge arrestors, insulation coordination. Surge protection of transmission lines, substations and rotating machine. Shielding and grounding. *(On demand)*

ECGR 6143. Power System Control. (3) Prerequisites: ECGR 4142 and 4111 or permission of department. Computer functions for automatic control of power systems. Automatic generation control, regulation of frequency and tie-line power interchanges. Automatic voltage regulation, excitation system model. Power system dynamics. Computer control centers. *(On demand)*

ECGR 6146. Advanced VHDL. (3) Prerequisite: ECGR 5146 or permission of department. Continuation of ECGR 5146. FPGA design with VHDL; VHDL modeling libraries and techniques, and VHDL coding methodology for efficient synthesid. *(Spring)*

ECGR 6151. Advanced Microelectronics Projects. (3) Prerequisite: ECGR 5133. Project-oriented course for the advanced microelectronics student to pursue the testing and simulation at various levels (component, gate, cell and system), as well as the design of a significant VLSI implementation. *(On demand)*

ECGR 6156. Application Specific Integrated Circuit Design. (3) Prerequisite: ECGR 5133 or permission of the department. Basic concepts, techniques and CAD tools in Application Specific IC Designs (ASIC); technology of ASIC circuits, method of design, CAD tools, and simulation and verification; practical aspects of design. *(Fall)*

ECGR 6171. Simulation of Electronic Materials. (3) Prerequisites: PHYS 6142/ECGR 6162 and PHYS 4271/ECGR 4171. Tight-binding theory of periodic solids; bond orbital theory applied the linear and non-linear opticall properties of insulators and semiconductors; calculation of vibrational spectra; Green's Function methods for amorphous solids. Simulation of electrically active defeats in solids. *(On demand)*

ECGR 6183. Multiprocessor Systems Design. (3) Prerequisites: ECGR 3184 and 5131. Topics include applications of multiprocessors to digital systems design; hardware/software tradeoff considerations; master/slave, multiple/master and loosely coupled systems; data handling and synchronization problems, networking. *(On demand)*

ECGR 6184. Computer System Engineering. (3) Prerequisite: consent of department. Topics include data formats, register transfer operations, computer organization, microprogram control and ALU design. Arithmetic algorithms, I/O organization and memory organization are also covered. Specific emphasis is placed throughout on tradeoffs between hardware and software. *(On demand)*

ECGR 6185. Advanced Microprocessor-Based Design. (3) Prerequisite: CSCI 4181 or permission of department. An advanced course in computer design utilizing 16-bit micro processors. Architecture, software, and interface techniques. This course is project-oriented, involving the use of a logic analyzer. *(Fall) (Evenings)*

ECGR 6186. Design for Testability. (3) Prerequisite: ECGR 2181 or permission of department. Fault modeling; test generation using the D-algorithm, PODEM, and FAN; partitioning; scan design, built-in self-testing; testing of array logic; and fault tolerance. Project-oriented course involving the use of logic and fault simulation tools. *(Spring) (Evenings)*

ECGR 6187. Modeling and Analysis of Communication Networks. (3) Prerequisite: Probability theory or consent of the department. Communication networks; application of analytical tools for modeling and performance evaluation of these networks, including stochastic processes, Markov models, queuing theory, and teletraffic theory. *(Spring)*

ECGR 6261. Microwave Circuit Design II. (3) Prerequisite: ECGR 5261, or permission of the department. Design/analysis of: (1) microwave low-noise, (2) power amplifier and (3) up/down converter circuits; circuit design examples from cellular and Personal Communications Systems (PCS); microwave and mm-wave circuit techniques. *(Spring)*

ECGR 6890. Individualized Study and Projects. (1-6) Individual investigation and exposition of results. May be repeated for credit. *(On demand)*

ECGR 6991. Graduate Master Thesis Research. (0-6) Individual investigation culminating in the preparation and presentation of a thesis. May be repeated for credit. *(On demand)*

ECGR 8021. Advanced Topics in EM and Applications. (3) See ECGR 6021 for Course Description.

ECGR 8090. Special Topics. (1-6) See ECGR 6090 for Course Description.

ECGR 8101. Advanced Computer Graphics. (3) See ECGR 6101 for Course Description.

ECGR 8102. Optimization of Engineering Designs. (3) See ECGR 6117 for Course Description.

ECGR 8111. Systems Theory. (3) See ECGR 6111 for Course Description.

ECGR 8112. Digital Control Systems. (3) See ECGR 6112 for Course Description.

ECGR 8114. Digital Signal Processing II. (3) See ECGR 6114 for Course Description.

ECGR 8115. Optimal Control Theory I. (3) See ECGR 6115 for Course Description.

ECGR 8116. Optimal Control Theory II. (3) See ECGR 6116 for Course Description.

ECGR 8117. Applied Artificial Intelligence. (3) See ECGR 6117 for Course Description.

ECGR 8118. Applied Digital Image Processing. (3) See ECGR 6118 for Course Description.

ECGR 8121. Advanced Theory of Communications I. (3) See ECGR 6121 for Course Description.

ECGR 8122. Advanced Theory of Communications II. (3) See ECGR 6133 for Course Description.

ECGR 8125. Optoelectronic Information Processing. (3) See ECGR 6125 for Course Description.

ECGR 8127. Medical Ultrasonics. (3) See ECGR 6127 for Course Description.

ECGR 8131. Hybrid Microelectronics. (3) See ECGR 6131 for Course Description.

ECGR 8132. Advanced Semiconductor Device Physics. (3) See ECGR 6132 for Course Description.

ECGR 8133. MOS Physics and Technology. (3) See ECGR 6133 for Course Description.

ECGR 8138. Physical Design of VSLI Systems. (3) See ECGR 6138 for Course Description.

ECGR 8141. Power System Relaying. (3) See ECGR 6141 for Course Description.

ECGR 8142. Voltage Transients and Surge Protection. (3) See ECGR 6142 for Course Description.

ECGR 8143. Power System Control. (3) See ECGR 6143 for Course Description.

ECGR 8146. Advanced VHDL. (3) See ECGR 6146 for Course Description.

ECGR 8151. Advanced Microelectronics Projects. (3) See ECGR 6151 for Course Description.

ECGR 8156. Application Specific Integrated Circuit Design. (3) See ECGR 6156 for Course Description.

ECGR 8171. Simulation of Electronic Materials. (3) See ECGR 6171 for Course Description.

ECGR 8183. Multiprocessor Systems Design. (3) See ECGR 6183 for Course Description.

ECGR 8184. Computer System Engineering. (3) See ECGR 6184 for Course Description.

ECGR 8185. Advanced Microprocessor-Based Design. (3) See ECGR 6185 for Course Description.

ECGR 8186. Design for Testability. (3) See ECGR 6186 for Course Description.

ECGR 8187. Modeling and Analysis of Communication Networks. (3) See ECGR 6187 for Course Description.

ECGR 8261. Microwave Circuit Design II. (3) See ECGR 6261 for Course Description.

ECGR 8890. Individualized Study and Projects. (1-6) See ECGR 6890 for Course Description.

ECGR 8999. Doctoral Dissertation Research. (0-9) Individual investigation culminating in the preparation and presentation of a doctoral dissertation. *(On demand)*

ENGINEERING

Department of Mechanical Engineering and Engineering Science

245 Smith Building
(704) 547-2303
http://www.mees.uncc.edu/gprogram/grad.html

Degree

M.S.E.

Coordinator

Dr. Jay Raja

Graduate Faculty

Harish P. Cherukuri, Assistant Professor
Robin N. Coger, Assistant Professor
James F. Cuttino, Associate Professor
Horacio V. Estrada, Assistant Professor
Yogeshwar Hari, Professor
Robert J. Hocken, Dickerson Distinguished Professor
Robert E. Johnson, Professor
Russell G. Keanini, Associate Professor
Rhyn H. Kim, Professor
Harry J. Leamy, Professor
Charles Y. Lee, Assistant Professor
Ganesh P. Mohanty, Bonnie E. Cone Distinguished Professor in Teaching
Edward P. Morse, Assistant Professor
Edgar G. Munday, Associate Professor
Steven R. Patterson, United Dominion Industries Distinguished Professor
Richard D. Peindl, Associate Professor
Jay Raja, Professor
Scott Smith, Professor
Stuart Smith, Associate Professor
Robert Wilhelm, Associate Professor

Program of Study

The Department of Mechanical Engineering and Engineering Science offers a program of study and research leading to the Master of Science in Engineering (M.S.E.). The M.S.E. degree offers a more generic program of study to students who may not possess a baccalaureate degree in engineering. To enter the M.S.E. program, applicants must present evidence of satisfactory undergraduate preparation in engineering or a closely allied area such as physics, chemistry, or biology. For information on Early Entry Program requirements to the Master of Science in Engineering, please see The William States Lee College of Engineering section of the Undergraduate Catalog.

Early-Entry to Graduate School

Exceptional undergraduate students at UNC Charlotte may be accepted into some master's programs and begin work toward a graduate degree before completion of the baccalaureate degree. In those programs offering this option, an applicant may be accepted at any time after completion of 75 or more hours, although it is expected that close to 90 hours will have been earned by the time the first graduate course is taken. These students will have provisional acceptance status, pending the award of the baccalaureate degree.

To be accepted in this program, an undergraduate student must have at least a 3.2 overall GPA and have taken the appropriate graduate standardized test and have earned an acceptable score. A given program may have more rigorous admissions criteria. If any early-entry student has not met the normal admission requirements of a 2.75 overall undergraduate GPA and a 3.0 junior-senior GPA at the end of his/her baccalaureate degree, she/he will be dismissed from the graduate program.

Students accepted into an early-entry program will be subject to the same policies that pertain to other matriculated graduate students. Generally, it will be assumed that early-entry students will finish their baccalaureate degrees before they complete 15 hours of graduate work.

Additional Admission Requirements

Applicants must demonstrate evidence of satisfactory undergraduate preparation in engineering, usually manifested by the possession of a baccalaureate degree from an accredited institution in some area of engineering, with a grade point average of at least 3.0 on a 4.0 scale. Special consideration may be given to candidates with substantial engineering work experience.

Applicants with baccalaureate degrees from fields other than engineering (e.g., engineering physics, chemistry, mathematics, etc.) may be considered for admission to graduate study on a conditional basis. Such applicants must remove deficiencies in their engineering background.

The applicant must receive a satisfactory score on the verbal and quantitative sections of the Graduate Record Examination General Test.

Acceptability for admission is based upon the applicant's record and background as determined by the department. The department has the prerogative to accept the applicant without reservation, to accept the applicant with conditions, or to deny the applicant. Any conditions are to be clearly stated and agreed to by the applicant before admission is completed.

Degree Requirements

The applicant must complete a minimum of at least 30 approved graduate credit hours as prescribed by the graduate advisor and fulfill the following:

1) A minimum of 18 semester hours in Mechanical Engineering and/or Engineering Science, no more than 6 of which can be thesis research or a creative design project; or, alternatively no more than three of which can be for a special problem or report. The decision as to whether a program will include a thesis, design project or problem report is to be made on an individual basis by the advisory committee at the time of filing the Student's Plan of Study.
2) The completion of one mathematics course (3 hrs), three core courses (9 hrs), four electives (12 hrs.) and 6 credit hours of thesis for students following a thesis or creative project option. In the case of students completing a problem report, the department requires one math course (3 hrs), three M.E.& E.S. core courses (9 hrs.), five elective courses (15 hrs), and 3 hours of problem report. Students must select course work to satisfy the General and M.E.& E.S. Department requirements.

Academic Standards

Only the grades of A, B. or C are accepted towards a graduate degree. A grade of U in any graduate course will terminate the student's enrollment subject to readmission as prescribed in the University catalog. Similarly, an accumulation of three C grades will result in termination of the student's enrollment, subject to readmission to a program. A student in any graduate program is required to maintain satisfactory progress toward the degree. Continued enrollment is at all times subject to review on the basis of academic record and actions with regard to observance of University rules and regulations.

Admission to Candidacy Requirements

Upon completion of a substantial amount of graduate work and in no case later than two weeks prior to the beginning of the semester in which the student expects to complete all requirements for the degree, the student shall file for Admission to Candidacy on a form supplied by The Graduate School. This application is a checklist approved by the advisor, department chair, and the College Dean listing all coursework to be offered for the degree (including transfer credit and courses in progress). A tentative date for the comprehensive examination should be agreed upon and indicated on this application. The date should be realistic and allow ample time for completion and review of the thesis or project.

The student and faculty advisor will agree on the appointment of an advisory committee. The advisory committee will be composed of at least three graduate faculty members *one of whom shall be from a department other than the student's major.* The graduate advisor will serve as chair of the committee. The committee is recommended by the department after appropriate consultation between the advisor and student.

Assistantships

Teaching and research assistantships are available on a competitive basis.

Core Courses

Mathematics (1 course from list):

MATH 6171 Advanced Applied Mathematics I
MATH 6172 Advanced Applied Mathematics II
MATH 6103 Computer Techniques and Numerical Methods

Any 6000 level math course approved by the thesis advisor.

ME Core Courses (3 courses from list):

MEGR 6116 Fundamentals of Heat Transfer and Fluid Flow
MEGR 6125 Vibrations of Continuous Systems
MEGR 6141 Theory of Elasticity I
MEGR 6166 Mechanical Behavior of Materials I
MEGR 6181 Engineering Metrology

Electives (4 courses for thesis option), (5 courses for problem report option):

Any 6000 or 7000 level mechanical engineering course or any graduate level course from the departments of Electrical and Computer Engineering Physics, Chemistry, and Computer Science may be taken with the advisor's approval.

Transfer Credit

Courses taken at any of the participating institutions are considered part of the program and are not treated as transfer courses. At the time of admission up to six hours of transfer credit may be accepted from an ABET accredited engineering institution.

Tuition Waivers

In-state and Out-of-state tuition waivers are available, on a competitive basis, to full time students with financial assistantships from UNC Charlotte.

MECHANICAL ENGINEERING

Master of Science Degree

Department of Mechanical Engineering and Engineering Science

245 Smith Building
(704) 547-2303
http://www.mees.uncc.edu/gprogram/grad.html

Degree
M.S.M.E.

Coordinator
Dr. Jay Raja

Graduate Faculty
Harish P. Cherukuri, Assistant Professor
Robin N. Coger, Assistant Professor
James F. Cuttino, Associate Professor
Horacio V. Estrada, Assistant Professor
Yogeshwar Hari, Professor
Robert J. Hocken, Dickerson Distinguished Professor
Robert E. Johnson, Professor
Russell G. Keanini, Associate Professor
Rhyn H. Kim, Professor
Harry J. Leamy, Professor
Charles Y. Lee, Assistant Professor
Ganesh P. Mohanty, Bonnie E. Cone Distinguished Professor in Teaching
Edward P. Morse, Assistant Professor
Edgar G. Munday, Associate Professor
Steven R. Patterson, United Dominion Industries Distinguished Professor
Richard D. Peindl, Associate Professor
Jay Raja, Professor
Scott Smith, Professor
Stuart Smith, Associate Professor
Robert Wilhelm, Associate Professor

Program of Study
The Department of Mechanical Engineering and Engineering Science offers a program of study and research leading to the Master of Science in Mechanical Engineering (M.S.M.E.). The programs in mechanical engineering and engineering science are structured in such a way as to be responsive to the ever-changing needs of the engineering profession and to foster a high degree of university-industrial interactions. The program is available on both a full-time and part-time basis. Entry into the M.S.M.E. program requires a baccalaureate degree in mechanical engineering. Qualified students may apply for early entry into a graduate program during their junior or senior undergraduate years. For information on Early Entry Program requirements to the Master of Science in Mechanical Engineering, please see below.

Early-Entry to Graduate School
Exceptional undergraduate students at UNC Charlotte may be accepted into some master's programs and begin work toward a graduate degree before completion of the baccalaureate degree. In those programs offering this option, an applicant may be accepted at any time after completion of 75 or more hours, although it is expected that close to 90 hours will have been earned by the time the first graduate course is taken. These students will have provisional acceptance status, pending the award of the baccalaureate degree.

To be accepted in this program, an undergraduate student must have at least a 3.2 overall GPA and have taken the appropriate graduate standardized test and have earned an acceptable score. A given program may have more rigorous admissions criteria. If any early-entry student has not met the normal admission requirements of a 2.75 overall undergraduate GPA and a 3.0 junior-senior GPA at the end of his/her baccalaureate degree, she/he will be dismissed from the graduate program.

Students accepted into an early-entry program will be subject to the same policies that pertain to other matriculated graduate students. Generally, it will be assumed that early-entry students will finish their baccalaureate degrees before they complete 15 hours of graduate work.

Additional Admission Requirements
Applicants must demonstrate evidence of satisfactory undergraduate preparation in engineering, usually manifested by the possession of a baccalaureate degree from an accredited institution in some area of engineering, with a grade point average of at least 3.0 on a 4.0 scale. Special consideration may be given to candidates with substantial engineering work experience.

Applicants with baccalaureate degrees from fields other than engineering (e.g., engineering physics, chemistry, mathematics, etc.) may be considered for admission to graduate study on a conditional basis. Such applicants must remove deficiencies in their engineering background.

The applicant must receive a satisfactory score on the verbal and quantitative sections of the Graduate Record Examination General Test.

Acceptability for admission is based upon the applicant's record and background as determined by the department. The department has the prerogative to accept the applicant without reservation, to accept the applicant with conditions, or to deny the applicant. Any conditions are to be clearly stated and agreed to by the applicant before admission is completed.

Degree Requirements
The applicant must complete a minimum of at least 30 approved graduate credit hours as prescribed by the graduate advisor and fulfill the following:
A minimum of 18 semester hours in Mechanical Engineering and/or Engineering Science, no more than 6 of which can be thesis research or a creative design project; or, alternatively no more than three of which can be for a special problem or report. The decision as to whether a program will include a thesis, design project or problem report is to be made on an individual basis at the time of filing the Student's Plan of Study.
Completion of one mathematics course (3 hrs), three core courses (9 hrs), four electives (12 hrs.) and 6 credit hours of thesis for students following a thesis or creative project

option. In the case of students completing a problem report, the department requires one math course (3 hrs), three M.E.& E.S. core courses (9 hrs.), five elective courses (15 hrs), and 3 hours of problem report. Students must select course work to satisfy the General and M.E.& E.S. Department requirements.

Academic Standards

Only the grades of A, B. or C are accepted towards a graduate degree. A grade of U in any graduate course will terminate the student's enrollment subject to readmission as prescribed in the University catalog. Similarly, an accumulation of three C grades will result in termination of the student's enrollment, subject to readmission to a program. A student in any graduate program is required to maintain satisfactory progress toward the degree. Continued enrollment is at all times subject to review on the basis of academic record and actions with regard to observance of University rules and regulations.

Admission to Candidacy Requirements

Upon completion of a substantial amount of graduate work and in no case later than two weeks prior to the beginning of the semester in which the student expects to complete all requirements for the degree, the student shall file for Admission to Candidacy on a form supplied by The Graduate School. This application is a checklist approved by the advisor, department chair, and the College Dean listing all coursework to be offered for the degree (including transfer credit and courses in progress). A tentative or, date for the comprehensive examination should be agreed upon and indicated on this application. The date should be realistic and allow ample time for completion and review of the thesis or project.

The student and advisor will agree on the appointment of an advisory committee. This committee will be composed of at least three graduate faculty members, *one of whom shall be from a department other than the student's major.* The graduate advisor will serve as chair of the committee. The committee is recommended by the department after appropriate consultation between the advisor and student.

Assistantships

Teaching and research assistantships are available on a competitive basis.

Transfer Credit

Courses taken at any of the participating institutions are considered part of the program and are not treated as transfer courses. At the time of admission up to six hours of transfer credit may be accepted from an ABET accredited engineering institution.

Core Courses

Mathematics (1 course from list):

- MATH 6171 Advanced Applied Mathematics I
- MATH 6172 Advanced Applied Mathematics II
- MATH 6103 Computer Techniques and Numerical Methods

Any 6000 level math course approved by the thesis advisor.

ME Core Courses (3 courses from list):

MEGR 6116 Fundamentals of Heat Transfer and Fluid Flow

- MEGR 6125 Vibrations of Continuous Systems
- MEGR 6141 Theory of Elasticity I
- MEGR 6166 Mechanical Behavior of Materials I
- MEGR 6181 Engineering Metrology

Electives (4 courses for thesis option), (5 courses for problem report option):

Any 6000 or 7000 level mechanical engineering course or any graduate level course from the departments of Electrical and Computer Engineering Physics, Chemistry, and Computer Science may be taken with the advisor's approval.

Tuition Waivers

In-state and Out-of-state tuition waivers are available, on a competitive basis, to full time students with financial assistantships from UNC Charlotte.

MECHANICAL ENGINEERING

Doctor of Philosophy

Department of Mechanical Engineering and Engineering Science

245 Smith Building
(704) 547-2303
http://www.mees.uncc.edu/gprogram/grad.html

Degree

Ph.D.

Coordinator

Dr. Jay Raja

Graduate Faculty

Harish P. Cherukuri, Assistant Professor
Robin N. Coger, Assistant Professor
James F. Cuttino, Associate Professor
Horacio V. Estrada, Assistant Professor
Yogeshwar Hari, Professor
Robert J. Hocken, Dickerson Distinguished Professor
Robert E. Johnson, Professor
Russell G. Keanini, Associate Professor
Rhyn H. Kim, Professor
Harry J. Leamy, Professor
Charles Y. Lee, Assistant Professor
Ganesh P. Mohanty, Bonnie E. Cone Distinguished Professor in Teaching
Edward P. Morse, Assistant Professor
Edgar G. Munday, Associate Professor

Steven R. Patterson, United Dominion Industries Distinguished Professor
Richard D. Peindl, Associate Professor
Jay Raja, Professor
Scott Smith, Professor
Stuart Smith, Associate Professor
Robert Wilhelm, Associate Professor

Program of Study

The Department of Mechanical Engineering and Engineering Science offers multi-disciplinary programs leading to a Ph.D. degree in mechanical engineering in the areas of biomedical engineering (BME), computer integrated manufacturing (CIM), computational modeling and simulation (CMS), and precision engineering (PE).

Biomedical engineering is a broad area of interdisciplinary study that combines engineering analysis with biological fundamentals to solve the increasingly complex problems encountered in medicine and the bio-sciences. The research at UNC Charlotte impacts a variety of fields including orthopedics, tissue engineering of bio-artificial organs, tissue preservation for transplantation and storage, and the imaging and modeling of biological processes. Consequently, the emphases chosen by Mechanical Engineering and Engineering Science graduate students include biomechanics, biofluids, bioheat and mass transfer, biomaterials, and bioinstrumentation.

The objective of the Ph.D. program in Biomedical Engineering is to develop students with a strong background in traditional mechanical engineering disciplines into graduates able to provide solutions to important biomedical research problems. Interdisciplinary knowledge is accomplished in collaboration with various departments in the College of Engineering, Biology, Chemistry, and Physics.

Computational Modeling and Simulation research within the Department of Mechanical Engineering and Engineering Science at UNC Charlotte is concentrated in computational mechanics and computational aspects of design, manufacturing, and metrology.

Research in Computational Mechanics currently addresses deformation process modeling, inverse methods, computational fluid dynamics and asymptotic methods for design model development. Current interests in deformation processing include modeling processes such as machining, sheet-rolling, casting, extrusion and quenching and predicting residual stresses and thermal distortion in quenched parts. Research in inverse problems focuses on reconstruction of dynamic, three-dimensional phase boundaries, traditional estimation of thermal boundary conditions, and reconstruction of time-varying porous media flows. Research in fluid mechanics includes theoretical modeling of flow and mass transfer in acoustic streaming fields, CFD modeling of flow and heat transfer in cooling ponds, and modeling of fundamental processes in arc plasmas. Many projects involve collaboration with the local industry.

Precision Engineering is a sub-discipline of manufacturing engineering dealing with processes where dimensional tolerances on the order of one part in 10^6 or better are required. Current trends in all aspects of manufacturing are toward tighter tolerances. These trends exist in normal machining, precision machining, and ultraprecision machining, which includes machining down to the level of near-atomic dimensions. At UNC Charlotte we recognize the importance of this field to remain competitive in a world economy and the opportunities for careers within this research area.

In order to fill this need our inter-disciplinary graduate program in precision engineering has as its objective the development of well-educated students with a firm background in both the traditional disciplines of mechanical engineering and those disciplines which are more uniquely associated with precision engineering. Traditionally, precision engineers have been involved in the design or the use of precision machine tools, metrology equipment, and other precision instruments and practices which are inherently interdisciplinary. For this reason the program at UNC Charlotte has four major technical thrust areas: design, manufacturing, metrology, and controls. The design area is intended to introduce students to the fundamental principles and techniques of the design of precision machines of all types. The manufacturing area is concentrated toward those who will be using high precision tools for the manufacture of high-value-added, high-tolerance components. For students interested in metrology, the measurement option has been constructed to give them a proper background for this important area. Finally, in the controls area, we address fundamentals necessary for the control of precision processes from the level of the servo control system to the more broadly defined computer science for controlling larger systems and total product quality.

Computer Integrated Manufacturing encompasses manufacturing processes, process automation, computational science, and integration of design, manufacturing and the product life cycle. CIM engineers develop and improve manufacturing processes as well as the computing approaches and systems needed for efficient operation and robust control.

At UNC Charlotte, CIM is studied with a focus on frameworks and techniques for a wide spectrum of metrology, computer numerical control of precision manufacturing processes, high tolerance design definitions and process plans, and software for distributed factory control systems. Students may also choose an interdisciplinary program that builds on UNC Charlotte's strong resources in mechanical design, electronics fabrication, computer science, and technology policy.

The Ph.D. program in CIM emphasizes applied research and addresses both theory and practical engineering for advanced systems and product development. Graduates are prepared to embark on research careers at universities and industry or national laboratories.

Students who complete the Ph.D. in CIM develop broad research skills to identify requirements for CIM systems and become expert in the design, implementation, and operation of particular CIM components. Breadth of knowledge is accomplished by studies in manufacturing processes, metrology, computer-aided design and manufacturing (CAD/CAM), mathematics, statistics, and computer science. Goals for focused skills are individually formulated for each student to suit their interests.

Additional Admission Requirements

In addition to the general requirements for admission to the Graduate School, the following are required for study toward the Ph.D. program in Mechanical Engineering:

1) A master's degree in engineering or a closely allied field with a GPA of at least 3.5. Students with only a baccalaureate degree may be admitted on a conditional basis, with an overall GPA of at least 3.2, but will not be formally admitted to the Ph.D. program until completion of the requirements for a master's degree.
2) The applicant must receive a satisfactory score on the verbal and quantitative sections of the Graduate Record Examination General Test.
3) Three letters of reference, at least two of which must be from faculty members. All three must be from professionals working in the applicant's field of interest.

Acceptability for admission is based upon the applicant's record and background as determined by the department. The department has the prerogative to accept the applicant without reservation, to accept the applicant with conditions, or to deny the applicant. Any conditions are to be clearly stated and agreed to by the applicant before admission is completed.

Degree Requirements

1) Appointment of a Ph.D. advisor and formation of an advisory committee.
2) Development of a Ph.D. Plan of Study detailing all course and examination requirements.
3) Successful completion of the written qualifying examination.
4) Presentation of a proposal for Ph.D. research and admission to candidacy.
5) Successful defense of the Ph.D. Dissertation.

Within the first semester of being admitted into a Ph.D. program, the student should choose a Ph.D. advisor and form an advisory committee. In conjunction with the Ph.D. advisor and this advisory committee, the student will develop a Plan of Study to meet the Ph.D. program requirements of course work and examinations and prepare to undertake original research leading to a dissertation of a quality that would be acceptable for publication of articles in peer-refereed professional journals.

Plan of Study

The Plan of Study must show at least 72 hours of credit beyond the baccalaureate degree including at least 18 hours of research/dissertation credits. For students who do not possess appropriate bachelor's and/or master's degrees in engineering, additional course work will be expected. The specific course requirements will be set by the student's advisory committee but must include: At least 30 hours within the major field of study, and two minors consisting of at least 6 hours each in related fields of study. The Plan of Study must be submitted to the Chair of the Department for review and approval within the second semester after admission to the Ph.D. program.

Residence

A student may satisfy the residency requirement for the program by completing 18 hours, either course work or research credits, by study-in-residence during the academic year and during the summer terms, as long as the study is continuous. Study-in-residence is deemed to be continuous if the student is enrolled in one or more courses (including research/dissertation credit) in successive semesters until eighteen hours of credit are earned.

Grades

A student is expected to achieve A's or B's in all course work taken for graduate credit and must have a GPA of at last a 3.0 in order to graduate. The dissertation is graded on a Pass/Unsatisfactory basis and, therefore, will not be included in the cumulative average. An accumulation of more than two marginal C grades will result in termination of the student's enrollment in the graduate program. If a student makes a grade of U on any course, enrollment will be terminated. A graduate student whose enrollment has been terminated because of grades is ineligible to attend any semester or summer session unless properly readmitted to the graduate program. Readmission to the program requires approval of the Dean of the Graduate School upon the recommendation of the student's major department and the Engineering Doctoral Graduate Committee of the College of Engineering.

Qualifying Examination

In addition to demonstrating a high level of competence in course work, the student must pass a comprehensive written qualifying examination in the major and minor areas. The qualifying examination should be taken before completion of 18 hours beyond the master's degree in the major and minor areas but must be passed no later than one year after initial admission to the program. Failure to

pass the qualifying examination in two tries will result in the termination of the student's enrollment in the Ph.D. program.

Admission to Candidacy Requirements

The single requirement for admission to candidacy is the appointment of an advisory committee. This committee will consist of at least three graduate faculty members, *one of whom shall be from a department other than the student's major*, with the graduate advisor serving as chair of the committee. The committee is recommended by the department after appropriate consultation between the advisor and student.

Dissertation Proposal and Admission to Candidacy

Because the Ph.D. program is heavily based on independent research, each student must write a proposal describing his/her proposed dissertation research following the technical guidelines established by the department. The proposal must be presented to and orally defended before the student's advisory committee. The proposal must be presented within one year after the qualifying examination is passed. Upon approval of the student's dissertation proposal, the advisory committee will recommend the student's admission to candidacy. This is subject to the approval of the Dean of the Graduate School.

Upon completion of a substantial amount of graduate work and in no case later than two weeks prior to the beginning of the semester in which the student expects to complete all requirements for the degree, the student shall file for Admission to Candidacy on a form supplied by The Graduate School. This application is a checklist approved by the advisor, department chair, and the College Dean listing all coursework to be offered for the degree (including transfer credit and courses in progress). A tentative date for the comprehensive examination should be agreed upon by the candidate and chair and indicated on this application. The date should be realistic and allow ample time for completion and review of the thesis or project.

Dissertation

Because the Ph.D. program is heavily based on independent research, each student must write a proposal describing his/her proposed dissertation research following the technical guidelines established by the department. The proposal must be presented to and orally defended before the student's advisory committee. The proposal must be presented within one year after the qualifying examination is passed. Upon approval of the student's dissertation proposal, the advisory committee will recommend the student's admission to candidacy subject to the approval of the Engineering Doctoral Graduate Committee and the Dean of the Graduate School.

Evidence of a high degree of competence in scholarship, written exposition, independent inquiry and the ability to organize and apply knowledge must be demonstrated by the student in the dissertation. The student will make a public defense of the dissertation at which time the dissertation, as well as the student's knowledge of the field, will be appropriate matter for examination by the student's advisory committee. Although questions may be asked by the general audience, evaluation of the dissertation defense is the sole responsibility of the advisory committee. The dissertation will be graded on a Pass/Unsatisfactory basis.

Assistantships

Teaching and research assistantships are available on a competitive basis.

Tuition Waivers

In-state and Out-of-state tuition waivers are available, on a competitive basis, to full time students with financial assistantships from UNC Charlotte.

Time Limit

Students are allowed a maximum of eight (8) calendar years from formal admission to the Ph.D. program to complete the program successfully.

Courses in Mechanical Engineering

Core Courses:

MEGR 6090. Special Topics. (1-6) (*For Post-Baccalaureate Students only*) Directed study of current topics of special interest. May be repeated for credit. (*On Demand*)

MEGR 6116. Fundamentals of Heat Transfer and Fluid Flow. (3) Prerequisite: MEGR 3114 or consent of the department. A unified treatment of transfer operations developed in terms of physical rate processes; formulation and solution of typical boundary value problems associated with heat, mass and momentum transfer. *(Spring)*

MEGR 6125. Vibrations of Continuous Systems. (3) Prerequisite: MEGR 4143. Analysis of vibration of continuos linear elastic structures such as strings, rods, beams and plates with varying boundary conditions. Approximate solution techniques such as Rayleigh, Rayleigh-Ritz and Galerkin are presented. (*Spring*)

MEGR 6141. Theory of Elasticity I. (3) Prerequisite: MEGR 3221 or consent of the department. Introduction to the theory of elastic media; the fundamentals of stress, strain, stress-strain relationships, compatibility and equilibrium. Applications to two- and three-dimensional problems. Structural mechanics and energy methods. (*Fall*)

MEGR 6166 Mechanical Behavior of Materials I. (3) Prerequisite: MEGR 3161 or equivalent or consent of the department. Macroscopic and microscopic aspects of elastic and plastic deformation and fracture of engineering materials; applications of dislocation theory to an interpretation and control of mechanical properties; temperature, strain rate and texture effects. *(Fall)*

MEGR 6181. Engineering Metrology. (3) Prerequisite: MEGR 3282. Introduction to metrology and standards. Uncertainty, precision and accuracy in metrology. Measurement of size and form, computational methods in measurement of form. Measurement of surface texture and out of roundness. Machine tool and robot accuracy and calibration. Evaluation of screw threads and gears. Introduction to design of precision instruments. *(Fall)*

Elective Courses:

MEGR 7090. Special Topics. (1-6) Directed study of current topics of special interest for Masters degree. May be repeated for credit *(On Demand)*

MEGR 7101. Transport Processes. (3) Prerequisite: Consent of instructor. Unified field theory approach to the fluid transport of momentum, energy, mass and electrical charge. Statistical theories of turbulence and molecular transport. Multiphase systems, chemically reacting flows, ionized fluids, separation processes. *(On Demand)*

MEGR 7102. Intro to Continua. (3) Prerequisites: MEGR 2144, MEGR 3114, or consent of instructor. A unified treatment of those topics which are common to all continua. Stress, deformation and velocity fields, constitutive equations and field equations. Representative applications in solid, fluid and electromagnetic continua, including interaction problems. *(On Demand)*

MEGR 7108. Finite Element Analysis and Applications. (3) Prerequisites: MEGR 6141 and MATH 6171 or permission of department. An introduction to the finite element method and its application to engineering problems. Application of the displacement methods to plane stress, plane strain, plate bending and axisymmetrical bodies. Topics may include but are not limited to: dynamics, heat conduction, and structural mechanics. (Dual-listed with CEGR 5108. *(Spring)*

MEGR 7110. Advanced Conductive Heat Transfer. (3) Prerequisite: MEGR 3116. Theory of steady and unsteady heat conduction in isotropic and anisotropic media. Treatment of concentrated and distributed heat sources. Application of the finite difference and finite element methods. *(Alternate Years)*

MEGR 7111. Advanced Engineering Thermodynamics. (3) Prerequisites: MEGR 3112 and MATH 3142. Postulational treatment of the laws of thermodynamics. Equilibrium and maximum entropy postulates. Development of formal relationships and principles for general systems. Applications to chemical, magnetic, electric, and elastic systems. *(On Demand)*

MEGR 7112. Radiative Heat Transfer. (3) Prerequisite: MEGR 3116. Fundamentals of radiation heat transfer, analysis of gray body and wavelength dependent systems; radiation from gases at high temperature, and particulate-laden gases; combined radiation and conduction. *(On Demand)*

MEGR 7113. Dynamics and Thermodynamics of Compressible Flow. (3) Prerequisites: MEGR 3111 and 3114. Compressible flow equations, isentropic flow, normal shock waves, Fanno and Rayleigh line flows. Nonsteady one dimensional flow. *(Alternate Years)*

MEGR 7114. Advanced Fluid Mechanics. (3) Prerequisite: MEGR 4112 or consent of department. Unified tensorial-theoretical treatment of the transport of mass, momentum, energy and voracity in fluids. General theorems for inviscid and irrational flows. Fiscous effects, boundary layer theory, nonlinear phenomena hydrodynamic instability and turbulence with applications. *(On Demand)*

MEGR 7115. Convective Heat Transfer. (3) Prerequisites: MEGR 3116 and MEGR 4112. Heat and momentum transfer prediction in channel flows and boundary layers. Differential equation methods for fully developed and entry length laminar tube flows. Similarity solution for laminar heat transfer. Superposition methods for non-uniform boundary conditions. Integral equations of the boundary layer, approximate and semiempirical methods of solution. *(Alternate Years)*

MEGR 7118. Thermal Environmental Engineering. (3) Prerequisite: MEGR 3116. Application of the thermodynamic and heat transfer principles to the analysis of thermal environmental systems. Topics include thermodynamic properties of moist air, psychometric charts, transfer processes, heating and cooling of moist air coils, physiological effects of thermal environments, food processing and storage *(Alternate Years)*

MEGR 7119. Thermal Applications in Biomedical Engineering. (3) Prerequisite: consent of the department. Application of thermodynamic and heat transfer principles to the analysis of biomedical systems. Topics include thermodynamic and transport properties of biological tissue, thermoregulation, design and use of cryosurgical probes, and numerical modeling methods. *(On Demand)*

MEGR 7120. Bearing Design and Lubrication. (3) Prerequisite: MEGR 3222 or consent of department. Hydrodynamic lubrication, fluid film and rolling element bearings, design and control of gas and fluid lubricated bearings. *(On Demand)*

MEGR 7121. Mechanism Analysis. (3) Prerequisite: MEGR 3221 or consent of department. Analysis of coplanar and spatial mechanisms, application of matrix methods in analysis of mechanisms, mobility analysis of mechanisms, rigid body guidance, computer aided analysis of mechanisms. (*Spring*) (*Evenings*)

MEGR 7122. Mechanism Synthesis. (3) Prerequisite: MEGR 7121 or consent of department. Synthesis of coplanar and spatial mechanisms, number and type synthesis, function generator, path generator, optimal synthesis of mechanisms, case studies in optimal design of mechanisms (*Alternate Years*).

MEGR 7123. Mechanical Design. (3) Prerequisite: MEGR 6141 or consent of department. Impact loading on critical sections, fatigue consideration, stress concentration, fluctuating stresses, failure analysis, contact stresses, industrial case studies (*Alternate Years*)

MEGR 7124. Introduction to Automatic Controls. (3) Prerequisite: Consent of the department. Emphasis on mechanical systems. Mathematical models and characteristics of control systems. Performance and stability of linear feedback systems. Root locus and frequency response techniques. State space methods. Design and compensation of control systems. (*Spring*)

MEGR 7126. Dynamics of Machinery. (3) Prerequisite: MEGR 3222 or consent of the department. Application of dynamics of machinery, balancing of rigid and flexible rotors. Dynamics of spatial mechanisms. Computer-aided dynamic analysis of machinery. (*On Demand*)

MEGR 7127. Computer-Aided Manufacturing. (3) Prerequisite: MEGR 3255 or consent of department. Topics covered include flowline production, numerical control, computer aided process monitoring and control, group technology, flexible manufacturing, and material requirement planning. (*Alternate Years*)

MEGR 7128. Control of Robotic Manipulators. (3) Prerequisite: MEGR 4127 or ECGR 4151. Control of industrial robots including linear, nonlinear, and adaptive control of the motion of robots; plus control of forces and torques exerted by the end-effector. Additional topics include computer animation of the controlled behavior of industrial robots, actuators and sensors, robot vision and artificial intelligence, and control computer/robot interfacing (dual-listed with ECGR 5151). (*Spring*)

MEGR 7129. Structural Dynamics of Production Machinery. (3) Prerequisite: Consent of the department. The analytical study of dynamic characteristics of production machinery and the corresponding measurement, specification, and effects on machine performance. Machine tool vibration, machine tool stability, high speed machining. (*Spring*)

MEGR 7142. Theory of Elasticity II. (3) Prerequisite: MEGR 6141 and MATH 6172. Continuation of MEGR 6141 with additional topics in three-dimensional analyses. Topics include complex variable techniques, variational methods and numerical techniques. (*On Demand*)

MEGR 7143. Inelastic Behavior of Materials. (3) Prerequisite: MEGR 6141 or consent of department. Introduction to plasticity and linear viscoelasticity. Topics include a study of yield criteria, plastic stress-strain relations, plastic hinge analysis, discrete viscoelastic models, the hereditary integral and selected boundary value problems (*Alternate Years*)

MEGR 7145. Advanced Topics in Dynamics. (3) Prerequisite: Consent of department. Selected advanced topics in dynamics such as Lagrangian dynamics, vibrations of continuous media, stress wave propagation and motion measurement. (*On Demand*)

MEGR 7146. Experimental Stress Analysis. (3) Prerequisite: MEGR 6141 or consent of department. Theoretical and experimental techniques of stress and strain analysis, with experimental emphasis on strain gages and instrumentation. Brittle coatings and photoelasticity are also considered. Two lectures and a two-hour lab per week. (*Alternate Years*)

MEGR 7161. Atomic Processes in Solids. (3) Prerequisite: MEGR 2144 or consent of department. Processes dependent on large- and small-scale atomic motions leading to changes in material structures and properties. Theories of diffusion controlled and diffusionless transformations. Modern concepts in structure and property control. (*On Demand*)

MEGR 7164. Diffraction/Spectroscopic Studies of Matter. (3) Prerequisite: Consent of instructor. Atomic arrangements in crystalline and non-crystalline forms of matter. Symmetry properties of crystals. Treatment of diffraction theory and experimental methods. X-ray diffraction and spectroscopic analysis of matter. (*Alternate Years*)

MEGR 7165. Diffraction and NDE Methods in Materials Science. (3) Prerequisites: MEGR 3161 or equivalent or consent of the department. Principles of diffraction and non-destructive evaluation methods and their applications to material problems; characterization of atomic and microstructural features and process induced defects in materials; evaluation of residual stress and texture effects; phase and elemental analysis; experimental methodologies. *(On Demand)*

MEGR 7166. Deformation and Fracture of Materials. (3) Prerequisite: Consent of instructor. Macroscopic and microscopic aspects of elastic and plastic deformation and fracture; applications of dislocation theory to an interpretation and control of mechanical properties; temperature, strain rate and texture effects. (*On Demand*)

MEGR 7167. Mechanical Behavior of Materials II. (3) Prerequisite: MEGR 6166 or equivalent. Continuation of MEGR 6166; selection of topics to include further treatments of dislocation theory and its applications; analysis of fatigue and creep phenomena; strength of polymers and composites; statistical treatment of strength; materials design and failure analysis. (*Spring*)

MEGR 7172. Computational Methods in Engineering. (3) Prerequisite: MATH 6171 or consent of the department. Numerical linear algebra, solution of systems of equations, numerical integration, differentiation and interpolation, root finding, numerical solution of partial differential equations by finite difference and finite element methods. (*On Demand*)

MEGR 7182. Machine Tool Metrology. (3) Prerequisites: MEGR 2180, MEGR 3281, and MEGR 6181. Machine tool accuracy and performance testing. Modeling and measurement of volumetric accuracy using parametric error separation and quasi-static error models. Use of homogeneous transformations for error mapping. Linear and higher order thermal models. Error budgeting and management. Axis of rotation metrology, spindle accuracy, and cutting performance tests. Laboratory experience on CNC machine tools using heterodyne laser interferometers, capacitance gages, and other computer assisted sensor systems for machine checking. (*Spring*)

MEGR 7183. Design of Precision Machines and Instrument I. (3) Prerequisites: MEGR 3221 and MEGR 7182. Basic patterns in the design of precision machines and instruments. Design process, error assessment and examples, materials, sensors, drives, and controls for precision machines. Machine frames, sliding and rolling element bearings, flexures, hydrostatic bearings. Design methodology, analysis of potential design, design case studies, and modeling of design alternatives. (*Fall*)

MEGR 7184. Design of Precision Machines and Instrument II. (3) Prerequisites: MEGR 7183. Application of principles, methodology, and analysis to specific design problems. Management of design. Class will design machine components, subsystems or whole instruments either individually or as members of design teams. Critical design reviews will be conducted. Designs will be quantitatively analyzed for conformance to design specifications and intent. (*Spring*)

MEGR 7281. Theory and Application of Computer-Aided Tolerancing. (3) Prerequisite: consent of the department. Theory of geometric tolerance representation, analysis, and synthesis. Applications of geometric tolerances for design function and efficient metrology. Laboratory experience with mechanical design and tolerance analysis software. Implementation projects for tolerance analysis and synthesis. (*Fall, Alternate Years*)

MEGR 7282. Computer-Aided Process Planning. (3) Prerequisite: consent of the department. Theory and computing methods for the specification, manufacture, and verification of manufactured artifacts with a particular emphasis on precision engineering applications. Representation of engineering designs. Feature recognition. Generation of manufacturing and metrology instructions. Computer software implementation projects. (*Fall, Alternate Years*)

MEGR 7283. Advanced Coordinate Metrology. (3) Prerequisite: MEGR 6181 or consent of the department. Error compensation of coordinate measuring machines, algorithms and sampling methods used in data analysis. Probing systems, compensation of probing errors. Scanning coordinate measuring machines and their dynamic behavior. Performance testing of coordinate measuring machines. (*Spring, Alternate Years*)

MEGR 7284. Advanced Surface Metrology. (3) Prerequisite: MEGR 6181 or consent of the department. Constituents of surface texture, stylus, optical, atomic force microscope and other advanced methods of measuring surface texture. Two and three dimensional measurement of surfaces. Separation of form, waviness and roughness. Random process analysis techniques, use of transforms for filtering. Numerical evaluation of surface texture. Use of surface texture as fingerprint of the process. Relationship between function and surface texture. (*Spring, Alternate Years*)

MEGR 7380. Tribology. (3) Prerequisite: consent of the department. Surface properties and study of surfaces in contact. Friction and wear of materials. Tribological properties of solid materials. Fluid lubricated journal bearings, lubrication of highly loaded contacts, lubricating systems and bearing selection. (*On Demand*)

MEGR 7480. Advanced Manufacturing Processes and Equipment. (3) Prerequisite: consent of the department. Detailed analytical treatment of manufacturing materials and processes. Forming processes (forging, extrusion, rolling, drawing, bending, shearing), casting processes, metal cutting processes (turning, boring, drilling, shaping, milling), tool materials, joining processes, automation. (*On Demand*)

MEGR 7892. Individual Study and Projects. (1-6) Individual investigation and exposition of results. May be repeated for credit. (*On Demand*)

MEGR 7893. Advanced Topics in Precision Engineering. (3) Prerequisite: consent of the department. Selected topics in precision control, materials for precision engineering, precision manufacturing, precision measurement, advanced analytical and numerical methods used in precision engineering (may be repeated as the topics vary and with the approval of the department).

MEGR 7991. Graduate Master Thesis Research. (1-6) Individual investigation culminating in the preparation and presentation of a thesis. May be repeated for credit (*Fall, Spring*)

MEGR 7999. Graduate Residence. (0) Required of all master's students not enrolled in other graduate courses who are working on or defending thesis/projects and/or are scheduled for comprehensive examinations. (*Fall/Spring*)

8000 level courses are for Ph.D. students only

MEGR 8090. Special Topics. (1-6) Directed study of current topics of special interest for Ph.D. degree. May be repeated for credit (*On Demand*)

MEGR 8101. Transport Processes. (3) See MEGR 7101 for Course Description.

MEGR 8102. Intro to Continua. (3) See MEGR 7102 for Course Description.

MEGR 8108. Finite Element Analysis and Applications. (3) See MEGR 7108 for Course Description.

MEGR 8110. Advanced Conductive Heat Transfer. (3) See MEGR 7110 for Course Description.

MEGR 8111. Advanced Engineering Thermodynamics. (3) See MEGR 7111 for Course Description.

MEGR 8112. Radiative Heat Transfer. (3) See MEGR 7112 for Course Description.

MEGR 8113. Dynamics and Thermodynamics of Compressible Flow. (3) See MEGR 7113 for Course Description.

MEGR 8114. Advanced Fluid Mechanics. (3) See MEGR 7114 for Course Description.

MEGR 8115. Convective Heat Transfer. (3) See MEGR 7115 for Course Description.

MEGR 8116. Fundamentals of Heat Transfer and Fluid Flow. (3) See MEGR 6116 for Course Description.

MEGR 8118. Thermal Environmental Engineering. (3) See MEGR 7118 for Course Description.

MEGR 8119. Thermal Applications in Biomedical Engineering. (3) See MEGR 7119 for Course Description.

MEGR 8120. Bearing Design and Lubrication. (3) See MEGR 7120 for Course Description.

MEGR 8121. Mechanism Analysis. (3) See MEGR 7121 for Course Description.

MEGR 8122. Mechanism Synthesis. (3) See MEGR 7122 for Course Description.

MEGR 8123. Mechanical Design. (3) See MEGR 7123 for Course Description.

MEGR 8124. Introduction to Automatic Controls. (3) See MEGR 7124 for Course Description.

MEGR 8125. Vibrations of Continuous Systems. (3) See MEGR 6125 for Course Description.

MEGR 8126. Dynamics of Machinery. (3) See MEGR 7126 for Course Description.

MEGR 8127. Computer-Aided Manufacturing. (3) See MEGR 7127 for Course Description.

MEGR 8128. Control of Robotic Manipulators. (3) See MEGR 7128 for Course Description.

MEGR 8129. Structural Dynamics of Production Machinery. (3) See MEGR 7129 for Course Description.

MEGR 8141. Theory of Elasticity I. (3) See MEGR 6141 for Course Description.

MEGR 8142. Theory of Elasticity II. (3) See MEGR 7142 for Course Description.

MEGR 8143. Inelastic Behavior of Materials. (3) See MEGR 7143 for Course Description.

MEGR 8145. Advanced Topics in Dynamics. (3) See MEGR 7145 for Course Description.

MEGR 8146. Experimental Stress Analysis. (3) See MEGR 7146 for Course Description.

MEGR 8161. Atomic Processes in Solids. (3) See MEGR 7161 for Course Description.

MEGR 8164. Diffraction/Spectroscopic Studies of Matter. (3) See MEGR 7164 for Course Description.

MEGR 8165. Diffraction and NDE Methods in Materials Science. (3) See MEGR 7165 for Course Description.

MEGR 8166. Mechanical Behavior of Materials I. (3) See MEGR 6166 for Course Description.

MEGR 8167. Mechanical Behavior of Materials II. (3) See MEGR 7167 for Course Description.

MEGR 8168. Deformation and Fracture of Materials. (3) See MEGR 7166 for Course Description.

MEGR 8172. Computational Methods in Engineering. (3) See MEGR 7172 for Course Description.

MEGR 8182. Machine Tool Metrology. (3) See MEGR 7182 for Course Description.

MEGR 8183. Design of Precision Machines and Instrument I. (3) See MEGR 7183 for Course Description.

MEGR 8184. Design of Precision Machines and Instrument II. (3) See MEGR 7184 for Course Description.

MEGR 8281. Theory and Application of Computer-Aided Tolerancing. (3) See MEGR 7281 for Course Description.

MEGR 8282. Computer-Aided Process Planning. (3) See MEGR 7282 for Course Description.

MEGR 8283. Advanced Coordinate Metrology. (3) See MEGR 7283 for Course Description.

MEGR 8284. Advanced Surface Metrology. (3) See MEGR 7284 for Course Description.

MEGR 8380. Tribology. (3) See MEGR 7380 for Course Description.

MEGR 8480. Advanced Manufacturing Processes and Equipment. (3) See MEGR 7480 for Course Description.

MEGR 8892. Individual Study and Projects. (1-6) See MEGR 7892 for Course Description.

MEGR 8893. Advanced Topics in Precision Engineering. (3) See MEGR 7893 for Course Description.

MEGR 8999. Doctoral Dissertation Research. (0-9) Individual investigation culminating in the preparation and presentation of a doctoral dissertation. (*On Demand*)

MEGR 9999. Doctoral Residence.

ENGINEERING MANAGEMENT

The William States Lee College of Engineering

274 Smith
(704) 547-2614
http://www.coe.uncc.edu

Degree

M.S.

Coordinator

J. William Shelnutt

Graduate Faculty

Kent E. Curran, Assistant Professor, Civil Engineering
Jack B. Evett, Professor, Civil Engineering
Johnny R. Graham, Associate Professor, Civil Engineering
L. Ellis King, Professor, Civil Engineering
Jy Shing Wu, Professor, Civil Engineering
David T. Young, Associate Professor, Civil Engineering
Keh-Hsun Chen, Associate Professor, Computer Science
Bei-Tseng Chu, Associate Professor, Computer Science
Mirsad Hadzikadic, Associate Professor, Computer Science
Junsheng Long, Associate Professor, Computer Science
Zbigniew Michalewicz, Professor, Computer Science
Zbigniew Ras, Professor, Computer Science
Kalpahthi R. Subramanian, Assistant Professor, Computer Science
William J. Tolone, Assistant Professor, Computer Science
A. Barry Wilkinson, Professor, Computer Science
Jing Xiao, Associate Professor, Computer Science
Edwin Braun, Associate Professor, Engineering Technology
Douglas Ramers, Assistant Professor, Engineering Technology
J. William Shelnutt, Professor, Engineering Technology
Haldun, Aytug, Professor, Information and Operations Management
Douglas Cooper, Professor, Information and Operations Management
Moutaz Khouja, Associate Professor, Information and Operations Management
Ram L. Kumar, Associate Professor, Information and Operations Management
Cem Saydam, Professor, Information and Operations Management
Anthony C. Stylianou, Associate Professor, Information and Operations Management
Ella Bell, Associate Professor, Management
Craig Pearce, Assistant Professor, Management
Kent N. Gourdin, Associate Professor, Marketing
Monica Perry, Assistant Professor, Marketing

Program of Study

The Engineering Management Master of Science Degree program prepares professionals for careers in managing projects, programs, and organizations. Industrial, research, consulting, and commercial firms now demand engineering managers with both cutting-edge technical competence and the management skills necessary to forge linkages with the business sides of these organizations. These managers must be able to form and manage high performance teams and manage technological operations. The program of study is necessarily multidisciplinary, combining elements of advanced study in various engineering disciplines with studies of business operations and organizational behavior.

Additional Admission Requirements

1) Either a bachelor's degree in engineering or a closely related technical or scientific field, or a bachelors degree in business, provided relevant technical course requirements have been met. It is expected that some students in the second category will have a major in business and a minor in engineering.
2) Undergraduate coursework in engineering economics (or equivalent).
3) Integral and differential calculus (MATH 1120 and 1121 at UNC Charlotte).
4) Statistics (STAT 1220 at UNC Charlotte).
5) An average grade of 3.0 (out of 4) on items 2,3, and 4 above.

Documents to be submitted for admission

1) Transcript(s) showing a baccalaureate degree in engineering, engineering technology, or a scientific discipline, or a baccalaureate degree in business administration from an accredited college or university.
2) A satisfactory score on the aptitude portion of the Graduate Record Examination (depending on the student's background, the Graduate Management Admission Test, GMAT, may be substituted in certain cases).
3) Written descriptions of any relevant and significant work experience.
4) If the applicant's native language is not English, an overall score of 575 (old system) or 230 (new computer-based examination) in the Test of English as a Foreign Language (TOEFL), with scores of at least 55 (20 on the new examination) on the individual sections: listening comprehension; structure and written expression; vocabulary and reading comprehension.

Degree Requirements

Thirty semester hours of approved graduate work within one of two options:

Option 1: Successful completion of 30 semester hours of graduate-level coursework.

Option 2: Successful completion of 24 semester hours of graduate-level coursework and six hours of thesis research.

The curriculum consists of six core courses and four additional courses (or two courses with the thesis option) selected from an approved list of electives. Students are expected to complete a Plan of Study that identifies a concentration such as Manufacturing Management or Environmental Management.

Required Core Courses:

EMGT 6901	Advanced Project Management (3)
EMGT 6142	Quality and Manufacturing Management (3)
MBAD 6161	Organizational Leadership and Behavior I (3)
MBAD 6164	Executive Communication (3)
MBAD 6195	Strategic Management of Technology (3)
MBAD 6141	Operations Management (3)

Note: Students will be required to have adequate preparation prior to taking the required MBAD (Master in Business Administration) courses. Normally this will consist of at least completion of courses in engineering economics, foundations of economics, and mathematics through differential and integral calculus. Students will be advantaged by having completed courses in foundations of accounting and statistics.

Elective Courses (Partial Listing – contact graduate coordinator for updated listing):

MBAD 6122	Technology Enhanced Decision Making (3)
EMGT 6902	Legal Issues in Engineering Management (3)
EMGT 6904	Product and Process Design (3)
CEGR 5142	Water/Wastewater Engineering (3)
CEGR 5234	Hazardous Waste Management (3)
CEGR 5235	Industrial Pollution Control (3)
CEGR 6142	Bioenvironmental Engineering (3)
CEGR 6144	Environmental Biotechnology (3)

Other graduate courses may be taken as elective courses for the engineering management degree with approval of the program coordinator.

Courses in Engineering Management

EMGT 6142. Quality and Manufacturing Management. (3) Provides an in-depth study of current issues and advances in manufacturing management. Topics include just-in-time inventory management, total quality management, statistical process control, continuous improvement, flexible manufacturing systems, computer-integrated manufacturing, technology evaluation and selection, and manufacturing strategy. Emphasis on use of computers for decision support.

EMGT 6901. Advanced Project Management. (3) Prerequisite: Consent of Instructor. Study of various aspects of project management including project types and organizations, regulatory and liability issues, planning, budget, risk assessment, and conflict resolution. Exercises involve research into emerging management processes, use of computerized techniques, and application of management theories in team-based projects. *(Alternate years)*

EMGT 6902. Legal Issues in Engineering Management. (3) Survey of legal issues surrounding engineering products and services, including warranty, liability, contracting, intellectual property, codes, and accepted practice. Legal principles, precedents, case studies, and research projects. *(On demand)*

EMGT 6904. Product and Process Design. (3) Application of principles of creative problem solving to design of products and processes by multi-disciplinary teams. Taking as the definition of design "the communication of a set of rational decisions for accomplishing stated objectives within prescribed constraints," the teams produce elements of designs for various products and services at points in the sequential stages of design. Teams make periodic reports and presentations to the class on design assignments. *(On demand).*

EMGT 6905. Designed Experimentation. (3) Prerequisites: Statistics and consent of instructor. Design of quality into products and processes using statistically designed experimentation (DOE), a systematic and efficient method of design optimization for enhanced performance, quality, and cost. Emphasis on designing and conducting useful experiments rather than the basis in statistical theory. Includes robust parameter design and tolerance design techniques. Review and comparison of Taguchi methods with conventional designed experimentation. Extensive use of specialized computer software to design experiments and analyze results in team projects; screening experiments, and sequential response surface methods.

ENGLISH

Department of English

275 Fretwell Building
(704) 547-2296

ENGLISH

Master of Arts Degree

Degree and Credentials

M. A., Certificates

Coordinator

Dr. Boyd Davis

Graduate Faculty

David Amante, Associate Professor
Christiane Bongartz, Assistant Professor
Deborah Bosley, Associate Professor
Lil Brannon, Professor
Paula Connolly, Associate Professor
Boyd Davis, Professor
Christopher Davis, Associate Professor
Susan Gardner, Associate Professor
Leon Gatlin, Associate Professor
Sandra Govan, Professor
Robert Grey, Associate Professor
Tony Jackson, Associate Professor
Jay Jacoby, Professor
Dennis Kay, Russell M. Robinson II Distinguished Professor of Shakespeare
Cy Knoblauch, Professor
Jeffrey Leak, Assistant Professor
Ronald F. Lunsford, Professor
James Holt McGavran, Professor
John McNair, Associate Professor
Margaret Morgan, Associate Professor
Anita Moss, Professor
Malin Pereira, Associate Professor
Esther Richey, Assistant Professor
Blair Rudes, Assistant Professor
Daniel Shealy, Professor
Frederik N. Smith, Professor
Ralf Thiede, Associate Professor
Sam Watson, Professor
Mark I. West, Professor
Greg Wickliff, Associate Professor

Program of Study

The master's program in English is designed to accommodate a wide variety of students: those seeking personal enrichment through increased knowledge and understanding; those preparing to pursue a Ph.D. in English or other advanced professional degrees; and those seeking professional advancement in such fields as writing, publishing, or teaching on the primary, secondary, or college levels. The Department offers a broad range of courses in literature, writing/rhetoric, and language, including second language studies.

Additional Admission Requirements

In addition to the general requirements for admission to the Graduate School, the following are required for study in English:

1) Thirty hours of undergraduate coursework in English beyond the freshman level, or evidence of equivalent academic preparation for graduate study in English, as approved by the Department.
2) A satisfactory score on the Aptitude portion of the Graduate Record Examination or on the Miller Analogies Test.

Degree Requirements

The program requires a minimum of 36 semester hours of graduate credit with grades of *A* or *B*. (A course in which a graduate student receives a grade of *C* is not allowable as part of the 36 required hours.) At least 18 semester hours must be in English courses at the 6000-level, open only to graduate students. A student must choose one of four emphases: literature, writing/rhetoric, language, or general.

Of the 36 hours of graduate credit, 30 must be in English courses; the remaining 6 hours may be taken in English or in another discipline. If the hours are to be taken outside of English, the student must submit a written request to the Coordinator of Graduate Studies, explaining how these hours will enrich his/her program.

No more than 6 hours of ENGL 6890 (Directed Reading), may be applied to the degree without written permission of the Chair of the Department.

Assistantships

A number of graduate assistantships are available each year. Applications must be submitted by March 15 for assistantships beginning the following academic year. Further information is available in the Department.

Internships

The Department of English offers a number of internships (ENGL 5410) for graduate students (limited to 3 hours of credit), which provide program-related experience in local television and radio stations, non-profit and government agencies, and local businesses and corporations. Further information is available in the Department.

Core Courses

All M.A. candidates, regardless of which emphasis is chosen, are required to take ENGL 6101 (Introduction to English Studies) and ENGL 6160 (Introduction to the English Language).

Emphasis Descriptions

The literature emphasis includes five literature courses, at least three of which are historically oriented. Two of these courses must be in one national literature and the third in a different national literature. In addition, one writing/rhetoric course, one literary theory-intensive course, and three electives are required. At least one course *must* be a designated seminar.

The writing emphasis includes four writing/rhetoric courses, one writing/rhetoric theory-intensive course, two literature courses, and three electives. At least one course *must* be a designated seminar. The writing emphasis may focus on creative writing, technical/professional writing, or writing and pedagogy.

The general emphasis includes one theory-intensive course, two writing/rhetoric courses, two literature courses, and five electives. At least one course *must* be a designated seminar.

The English language studies emphasis includes two writing/rhetoric courses, two literature courses, and four courses selected from the following:

ENGL 5161	Modern Grammar
ENGL 5165	Language and Culture
ENGL 5166	Comparative Language Studies for Teachers
ENGL 5260	History of the English Language or:
ENGL 6162	History of the English Language
ENGL 5263	Linguistics and Language Learning or:
ENGL 6163	Language Acquisition
ENGL 6161	Introduction to Linguistics
ENGL 6070	Topics in English (Approval of Graduate Coordinator required)

In addition, students will choose one course from the following:

ENGL 5050	Topics in English (linguistics topics only)
ENGL 5254	Teaching English/Communications Skills to Middle and Secondary School Learners
ENGL 5400	English Composition Practicum
ENGL 5264	Literacy in Community/Family
ENGL 6195	Teaching College English

Depending on individual goals and the quality of their undergraduate preparation, students may choose to substitute a course from outside the Department such as TESL 5101 (Second Language Diagnosis and Evaluation); FORL 4200 (Secondary Methods--Foreign Languages); or ANTH 5120 (Intercultural Communications).

Courses beyond 36 hours of graduate credit may be required to remove deficiencies or to satisfy requirements for graduate licensure, or may be recommended to develop areas of need, to pursue particular interests, or to gain specific experience.

Advising

The graduate coordinator or another graduate faculty member acting as his/her designated assistant will advise graduate students.

Licensure

Students seeking licensure in English should refer to the requirements of the M. A. in English Education program.

Comprehensive Examination

Students must satisfactorily complete a written examination based partly on a core reading list and partly on a reading list based on their chosen emphasis. These lists are available in the Department office. The written examination may not be attempted sooner than the last semester of coursework, exclusive of thesis credits. The

reading lists were revised for students entering the program in Spring 2000 and thereafter.

Thesis
The M.A. thesis is optional; it may be either scholarly or creative. See course description for ENGL 6996.

Tuition Waivers
Each year, one one-of-state tuition waiver is available for a new graduate assistant. In-state tuition waiver funds are also available for new graduate assistants and sometimes for other outstanding applicants.

Financial Aid/Financial Assistance
Loan Fund. The Anne R. Newman Graduate Student Loan Fund makes emergency money available to graduate students for the semester's tuition, fees and books, or other expenses related to the pursuit of an M.A. in English. Further information is available in the Department.

ENGLISH EDUCATION

Department of English
(see previous listing under English)

Department of Middle, Secondary, and K-12 Education
5029 Colvard Building
(704) 547-3220

Degree
M.A.

Coordinator
Dr. Lil Brannon

Program of Study
Designed for experienced middle and secondary English teachers, the M.A. in English Education qualifies graduates for the new Masters/Advanced Competencies "M" license in English Education. The program includes core courses team-taught by faculty in the English Department and the College of Education which focus on issues in the teaching of English and on research methods and advanced study in English and professional education, including a core course in teacher leadership.

Aligned with the 1997 North Carolina Excellent Schools Act and the proposition of the National Board for Professional Teaching Standards, the program prepares graduates to become master teachers who are (1) self-directed in their personal and professional growth as educators, (2) responsive to children's differences influenced by development, exceptionalities, and diversity, (3) well-grounded in the content and pedagogy of English/Language Arts curriculum, (4) self-reflective, self-evaluative, educational researchers, and (5) collaborative leaders.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, applicants must:
1) Hold the "A" license in Secondary English or Middle Grades Language Arts from the North Carolina Department of Public Instruction (or its equivalent from another state),
2) have at least two years experience of full-time teaching in the secondary or middle grades classroom,
3) an undergraduate GPA of 2.75 overall and 3.0 in the junior/senior years and thirty hours of undergraduate course work in English beyond the freshman level, or evidence of equivalent academic preparation,
4) a satisfactory essay that provides a statement of purpose for Master's degree study,
5) a personal interview, and
6) a teaching portfolio.

Degree Requirements
The M.A. in English Education Program requires completion of at least 38 semester hours of graduate credit with grades of A or B in approved courses including:

Core Course Requirements (14 hours)
- ENGL/EDUC 6274 Contexts and Issues in the Teaching of English (4)
- ENGL/EDUC 6674 Applied Research Methods in the Teaching of English (4)
- ENGL/EDUC 6974 Thesis/Project in the Teaching of English (6)

Professional Requirements (12 Hours)
- MDSK 6260 Principles of Teacher Leadership (3)

Also, 9 additional hours of graduate-level Education courses selected in consultation with the Program Coordinator. The program's 9 hours of professional courses are not free electives, but a planned program of study identified upon the students' enrollment in the program as part of the students' overall professional and program plan.

Content Specialization Requirements (12 Hours)
12 hours of graduate-level English courses selected in consultation with the Program Coordinator. The program's 9 hours of content specialization courses are not free electives, but a planned program of study identified upon the students' enrollment in the program as part of the students' overall professional and program plan.

At least 18 hours of course work in the program must be in English or Education courses at the 5000 level or higher.

Assistantships
Assistants are awarded on a competitive basis through the Department of English and the Department of Middle Grades, Secondary, and K-12 Education

Capstone Experience
Students are required to complete a Master's Thesis/Project, a formal piece of scholarship, that investigates a particular problem in English education and attempts to provide either data-based practical solutions to the problem or a philosophical/theoretical exploration of the problem and its implications for the classroom. Following the approval from the students' thesis committee, the candidate must present the findings in a professional manner at a level expected of a master teacher. At this presentation, the students will also present their program portfolio which documents their growth in the program.

Licensure
The M.A. in English Education qualifies graduates for the Masters/Advanced Competencies "M" license in English Education.

ENGLISH LANGUAGE STUDIES
Graduate Certificate

The Graduate Certificate Program in English Language Studies enables professionals to focus and solidify or update their work with language teaching and research applications. As technology-supported applications of language theory increase, and as teaching and research opportunities change in response to demographic and educational demands, both in the U.S. and in the global community, this Certificate grounds the participants in both current theory and practice and makes courses in the English Language Studies Concentration available to persons with related degrees and professional aspirations.

Certificate Requirements
The Graduate Certificate in English Language Studies requires 12 hours in approved courses, including at least 6 hours at the 6000-level. A typical program might include 4 of the following courses: ENGL 5161 (Modern English Grammar), ENGL 5165 (Language and Culture), ENGL 6161 (Introduction to Linguistics), ENGL 6163 (Language Acquisition), ENGL 6195 (Teaching College English). Students must earn a grade of "B" or better in all courses presented for the certificate, and must complete the program within four years from the time of first enrollment in a certificate course.

It is expected that students will structure their program to gain a concentration in theory and content in either applied linguistics or some aspect of second-language teaching. Substitutions from the broader linguistics emphasis and graduate program will be allowed with approval of the Certificate Coordinator, who will act as advisers for those enrolled in the Certificate program.

Students whose dominant language is not English will take in addition one or both courses in a two-semester sequence in Second Language Writing: Theory and Applications. The first elective course, offered as a topics course in rhetoric, covers the theory of second-language writing. The second part of the sequence, offered as an independent study, consists of a workshop in written discourse, with special emphasis on western academic discourse. It includes documentation and bibliographic searching techniques at the graduate level.

Transfer credits are not accepted in the Certificate program. Students seeking licensure for the teaching of English at levels K-12 should consult the College of Education.

TECHNICAL/ PROFESSIONAL WRITING
Graduate Certificate

The University of North Carolina at Charlotte offers a Graduate Certificate Program in Technical/Professional Writing designed for post-baccalaureate, graduate, and post-graduate students. Students can complete the required 21 graduate credit hours in approximately two years. Students will learn to design information, use hypermedia tools, create on-line support systems, design visuals, develop web pages, manage publications and projects, work with clients, develop portfolios, and learn page layout, graphics, and other software applications.

Admission Requirements
Students must apply for admission to the graduate school and must have a minimum undergraduate GPA of 2.75. Applicants will be required to submit: 1) a current GRE score; 2) a current MAT score; or 3) a portfolio of professional documents. Only graduate courses taken at UNC charlotte will count towards this Graduate Certificate.

Certificate Requirements (9 hours)

ENGL 6166	Rhetorical Theory
ENGL 6008	Topics in Advanced Technical Communication
ENGL 5410	Professional Internship

Electives (12 hours)

ENGL 5180	Theories of Technical Communication
ENGL 5181	Writing User Documents

ENGL 5182 Writing & Designing Computer-based Documents
ENGL 5183 Editing Technical Documents
ENGL 5008 Topics in Technical Communication
Other Courses: as appropriate and approved by the Department

COURSES IN ENGLISH

ENGL 5002. Women and Literature. (3) Selected topics focusing on women and literature, such as images of women, women as writers, and women as literary critics. With permission of the English Department, may be repeated for credit as topics vary. (However, only six hours may be used for the requirements for the English major.) *(Yearly)*

ENGL 5008. Topics in Advanced Technical Communication. (3) Exploration, both theoretically and practically, of the interrelation of written, oral and graphic communication within technical rhetorical contexts. May be repeated once for additional credit with the approval of the English Department *(On demand)*

ENGL 5050. Topics in English. (3) Special topics not included in other courses. May be repeated for additional credit with approval of the English Department. *(On demand)*

ENGL 5090. Major Authors. (3) The works, ideas and life of one to three significant authors. With permission of the English Department, may be repeated once for credit as long as different authors are considered. *(Fall, Spring)*

ENGL 5102. Classics in British Children's Literature. (3) Focuses on pivotal works in the history of British and British Colonial Children's Literature. *(Fall)*

ENGL 5103. Classics in American Children's Literature. (3) Focuses on pivotal works in the history of American Children's Literature. *(Spring)*

ENGL 5104. Multiculturalism and Children's Literature. (3) Focuses on works that represent one or more kinds of cultural, ethnic, or social diversity of the United States and other national literatures. *(Fall)*

ENGL 5114. Milton. (3) A study of the major poems and selections from the minor works of Milton. *(Alternate years)*

ENGL 5116. Shakespeare's Early Plays. (3) A study of 10 representative plays from the comedies, histories and tragedies written 1590-1600. *(Fall, Spring)*

ENGL 5117. Shakespeare's Late Plays. (3) A study of 10 representative plays from the period 1600-1611, including the late tragedies and tragi-comedies. *(Fall, Spring)*

ENGL 5121. The 18th-Century British Novel: Man, Woman, Manners and Morals. (3) The novel as narrative form and as mirror of the individual in society. Emphasis on fiction by Defoe, Richardson, Fielding, Sterne, Austen, with further readings in the novel of manners and the Gothic romance. *(Alternate years)*

ENGL 5122. The Victorian Novel. (3) Readings in British fiction during the triumph of the novel in the 19th century, emphasizing major developments in realism, romance, naturalism. *(Alternate years)*

ENGL 5123. The Modern British Novel. (3) Representative British novels that embody the cultural and literary developments of the 20th century: the impact of two world wars, the influence of important psychological and economic factors of modern life and their relationships to new techniques in art and literature *(Alternate years)*

ENGL 5124. Modern Irish Literature. (3) Readings in Irish literature since 1885, with consideration of the mythology, folklore, and social history of Ireland as they are expressed in poetry, drama and fiction. *(Yearly)*

ENGL 5131. British Drama to 1600, Excluding Shakespeare. (3) A survey of the development of British drama to 1600, with representative plays from the Mystery-Miracle Cycles, the Morality Plays, and Tudor drama, including Lyly, Kyd, Marlowe, Peele, Greene, Dekker. *(On demand)*

ENGL 5132. British Drama from 160-1642, Excluding Shakespeare. (3) A survey of Jacobean and Caroline drama, including plays by Jonson, Beaumont and Fletcher, Webster, Middleton, Shirley, Ford. *(Alternate years)*

ENGL 5133. British Drama of Wit and Intrigue, 1660-1780. (3) The famous bawdy comedy of manners and the heroic drama of the Restoration, followed by the sentimental comedy and satiric burlesque of the 18th century. *(Alternate years)*

ENGL 5143. The American Novel of the 19th Century. (3) Major novelists and traditions from the beginnings of the American novel through the rise of realism, including such novelists as Hawthorne, Melville, Twain, Howells, James. *(Alternate years)*

ENGL 5144. The American Novel of the 20th Century. (3) Major novelists and traditions from the emergence of naturalism to the present, including such novelists as Crane, Dreiser, Hemingway, Faulkner. *(Yearly)*

ENGL 5145. Literature of the American South. (3) Selected works of Southern writers which reflect literary and cultural concerns from Colonial times to the present, including such authors as Poe, the early humorists, local

color writers, Chopin, Faulkner, Warren, O'Connor, Welty. *(Yearly)*

ENGL 5146. Contemporary Jewish-American Literature. (3) An introduction to the scope and shape of the contemporary Jewish-American literary traditions. Such writers as Bellow, Malamud, Roth, Singer, and Potok will be studied. *(Alternate years)*

ENGL 5147. Early Black American Literature. (3) A survey of significant writings by black Americans before the Harlem Renaissance. *(Alternate years)*

ENGL 5148. Twentieth-Century Black American Literature: Prose. (3) Intensive study of selected black American 20th-century writers of fiction and nonfiction, beginning with the Harlem Renaissance. *(Alternate years)*

ENGL 5150. Contemporary Poetry. (3) Poetry in English (including translations) since 1940. *(On demand)*

ENGL 5151. Modern Drama. (3) Representative Continental, British, and American plays, from Shaw to the present. *(Alternate years)*

ENGL 5152. Modern European Literature. (3) Selected modern European authors, translated into English, whose works have been of special interest to readers and writes of British and American literature. *(Alternate years)*

ENGL 5153. Contemporary Fiction. (3) Selected present-day fiction, with an emphasis upon works from outside the United States and Britain. Works not originally in English will be studies in translation. *(Alternate years)*

ENGL 5155. Pan-African Literature. (3) Introduction to significant Pan-African literature, emphasizing the oral tradition, selected works of major authors in the Caribbean and Africa, and the relationships of these traditions to American, British and other literary traditions. Works not originally written in English will be studies in translation. *(On demand)*

ENGL 5156. Gender and African American Literature. (3) Exploration of the intersection of gender and African American Literature, focusing on either Black women writers or Black male writers, or a combination in dialogue. *(Alternate years)*

ENGL 5157. African American Poetry. (3) Intensive study of African American poetry, focusing on one period or traversing several. *(Alternate years)*

ENGL 5158. African American Literary Theory and Criticism. (3) History of an African American approach to literary analysis, including a practicum in modern criticism. *(Alternate years)*

ENGL 5161. Modern English Grammar. (3) A study of the structure of contemporary English, with an emphasis on descriptive approaches. *(Yearly)*

ENGL 5165. Language and Culture. (3) Readings in and discussion and application of the interrelationships between language and culture, including basic introduction to contemporary American dialects and to social contexts of language. *(Yearly)*

ENGL 5166. Comparative Language Studies for Teachers. (3) An introductory course designed to aid the teacher of English as a Second Language in comparing the systems of sound and structure of another language with those systems in English. *(Yearly)*

ENGL 5180. Theories of Technical Communication. (3) Rhetorical, psychological, and anthropological theories which underscore the interrelations of written and graphic communication within technical, rhetorical contexts. *(Fall)*

ENGL 5181. Writing User Documents. (3) Researching and analyzing audiences to write publishable instructions. This includes the production, testing, and revision of tutorials, reference manuals and on-line documents for users of computers and other devices. *(Spring)*

ENGL 5182. Writing and Designing Computer-based Documents. (3) Theoretical and practical exploration of desktop publishing. Students will write and publish camera-ready documents by rhetorically integrating text and graphics using computer aids. *(Fall)*

ENGL 5183. Editing Technical Documents. (3) Document editing, including copy editing, proofreading, substantive editing, and project management. *(Spring)*

ENGL 5202. Writing Poetry. (3) Further study of and practice in the writing of poetry within a workshop format. May be repeated once for credit with the consent of the English Department. *(Fall, Spring) (Evenings)*

ENGL 5203. Writing Fiction. (3) This course provides further study of and practice in the writing of fiction within a workshop format. May be repeated once for credit with the consent of the English Department. *(Fall, Spring) (Evenings)*

ENGL 5204. Expository Writing. (3) Writing of essays, criticism and various forms of exposition. *(Fall, Spring) (Evenings)*

ENGL 5205. Advanced Expository Writing. (3) May be repeated once for credit with permission of the English Department. *(Alternate years)*

ENGL 5208. Poetry Writing Workshop. (3) Designed for advanced writers of poetry. Focuses primarily on

student work and peer criticism of it. May be repeated once for credit with permission of department. *(Yearly)*

ENGL 5209. Fiction Writing Workshops. (3) Designed for advanced writers of fiction. Focuses primarily on student work and peer criticism of it. May be repeated once for credit with permission of department. *(Yearly)*

ENGL 5210. Greek and Roman Drama in Translation. (3) A study of selected plays of Aeschylus, Sophocles, Euripides, Aristophanes, Plautus, Terence, and Seneca with emphasis on dramaturgy and the development of the Greek and Roman theater. *(On demand)*

ENGL 5211. Chaucer. (3) The poetry of Geoffrey Chaucer, including the Canterbury Tales and Troilus and Criseyde. *(Alternate years)*

ENGL 5251. Literary Criticism Through Arnold. (3) The major schools and critics of literary criticism. *(On demand)*

ENGL 5252. Modern Literary Criticism. (3) Theories of the modern schools of criticism. *(On demand)*

ENGL 5254. Teaching English/Communications Skills to Middle and Secondary School Learners. (1-3) Approaches to the teaching of English, including recent theories and research related to writing and literary study, designed primarily for teaching in grades 6-12. *(Yearly)*

ENGL 5260. History of the English Language. (3) Origins and development of the English language, both spoken and written, from its earliest forms to contemporary usage. *(Yearly)*

ENGL 5263. Linguistics and Language Learning. (3) Readings in, discussions of, and application of linguistically oriented theories of language acquisition, directed toward gaining an understanding of language-learning processes and stages. *(Alternate years)*

ENGL 5264. Literacy in Family and Community. (3) Exploration of literacy issues and outreach in schools, agencies, and work sites. *(Spring)*

ENGL 5290. Advanced Creative Project. (3) Prerequisite: ENGL 5208 or 5209 or permission of the instructor. The planning, writing, and polishing of a work of at least 20 pages of poetry or at least 40 pages of fiction or creative non-fiction by advanced undergraduate or graduate students with the guidance of a member of the Department's creative writing faculty. The final work may be a single piece or a collection of pieces and will evolve under the supervision of the primary instructor. With permission of the Department, students who took the course as undergraduates may repeat as graduate students. *(On demand)*

ENGL 5400. English Composition Practicum. (1-3) Prerequisite: consent of the instructor. Through supervised tutorial experience and seminars, this course introduces the student to current developments concerning composition and to a variety of methods for teaching English composition. This course is highly recommended for those planning to teach or those currently engaged in teaching. With permission of the English Department may be repeated once for credit. *(Fall, Spring)*

ENGL 5410. Professional Internship. (3 or 6) Prerequisites: permission of English Internship Coordinator. Restricted to juniors, seniors, graduate students majoring in English or minoring in English or communications who have at least a 2.5 GPA and a course in professional communication (e.g., journalism, technical communication, public relations, public relations lab, or mass media). Students work 8-10 hours (3 hours credit) or 16-20 hours (6 hours credit) per week in a placement arranged by the Internship coordinator. Only three credit hours may be applied to the English major at either the undergraduate or graduate level; three additional hours may be counted as a University or Communications elective. *(Fall, Spring, Summer)*

ENGL 5852. Independent Study. (1-3) Prerequisite: consent of the Department. Individual investigations and appropriate exposition of the results. (Unless special permission is granted by the Department Chair, no more than six hours may apply toward the English major.) May be repeated for additional credit with approval of the English Department. *(Fall, Spring, Summer)*

ENGL 6008. Topics in Advanced Technical Communication. (3) Theoretical and practical exploration of advanced topics in technical communication, including projects in which students write and publish documents by rhetorically integrating text, graphics, and other media using computer aids. *(Yearly)*

ENGL 6062. Topics in Rhetoric. (3) Examination of and/or research concerning selected issues in rhetorical theory or pedagogy. May be repeated for credit with English Department approval. *(Fall, Spring)*

ENGL 6070. Topics in English. (3) Selected topics of literature and language. May be repeated for credit as topics vary and with English Department approval. *(Fall, Spring)*

ENGL 6101. Introduction to English Studies. (3) The discipline of English--its nature, its history, and its methods. Emphasis on (1) the interrelations of literature, language, and writing; and (2) the diversity of cultural origins and critical perspectives in English studies, with

concentration on selected major critical approaches. Intensive writing and practice in methods of research. Required of all M.A. in English students, preferably at or near the beginning of their programs. *(Fall, Spring)*

ENGL 6102. Literary Theory. (3) Modern literary theory focusing on the theoretical concepts which underpin literary analysis. Emphases may differ from semester to semester; readings will focus on major theoretical statements and on criticism which applies several approaches to particular literary works. Students will be required to apply what they have learned. *(Yearly)*

ENGL 6103. The Worlds of Juvenile Literature. (3) Poetry, folk literature, modern fantasy, realism, and illustrations in books for young children and adolescents. Analysis of the literary qualities which distinguish the classic from the ephemeral through such critical approaches as the historical, the sociological, the psychological and the archetypal. *(Yearly)*

ENGL 6104. Major Figures in Children's Literature. (3) Focuses on specific authors or illustrators who have made important contributions to the evolution of children's literature. *(Spring)*

ENGL 6111. Shakespeare's Comedies and Histories. (3) Source materials, textual problems and stage conventions in selected comedies and history plays illustrating Shakespeare's dramaturgy. *(Yearly)*

ENGL 6112. Shakespeare's Tragedies. (3) Source materials, textual problems and stage conventions of the great tragedies, illustrating Shakespeare's dramaturgy. *(Yearly)*

ENGL 6113. Milton. (3) The complete poetry and selections from the prose. *(On demand)*

ENGL 6123. The Augustan Age, 1660-1785. (3) Close reading of Dryden, Pope, Swift, Johnson,, and a consideration of other literary figures and trends, in the light of intellectual and historical currents. *(On demand)*

ENGL 6125. The Romantic Era, 1785-1832. (3) Development of the Romantic movement, with emphasis on the works of Wordsworth, Coleridge and other major poets. *(Alternate years)*

ENGL 6126. The Victorian Era, 1832-1900. (3) Emphasis on Tennyson, Robert Browning, Arnold, Carlyle, Ruskin, Newman. *(Alternate years)*

ENGL 6141. American Romanticism. (3) Major writers of the 1830s, 40s, and 50s, including Hawthorne, Melville, Whitman, Emerson, Thoreau, and the Transcendental Movement. *(Alternate years)*

ENGL 6142. American Realism and Naturalism. (3) Major writers of the two movements before and after the end of the 19th century, including Twain, Howells, James, Crane, Dreiser, Norris. *(Alternate years)*

ENGL 6143. American Modernism. (3) Six to eight writers of the period since World War I, both prose and poetry. *(Alternate years)*

ENGL 6144. Stylistics. (3) Methodologies for analysis of the style of texts, with special emphasis on diction, syntax, prose, rhythm, voice, and metaphor. *(Alternate years)*

ENGL 6147. Perspectives in African-American Literature. (3) A survey of African-American literature, emphasizing the major authors, those relevant historical and social factors, and those specific literary movements that have influenced the development of African-American literature. *(Alternate years)*

ENGL 6160. Introduction to the English Language. (3) History and nature of English, its grammar, syntax, and lexicon. Integrates the study of language-based rhetorical and literary theory, asks students to consider the nature of language in general, its impact on the user, and the development of the systems of English, concentrating on features of major British and American dialects and registers. *(Fall, Spring)*

ENGL 6161. Introduction to Linguistics. (3) Introduction to linguistics, its techniques and objectives, descriptive and historical approaches, language families, language and culture. *(Alternate years)*

ENGL 6162. History of the English Language. (3) Origins and development of spoken and written English, from its earliest forms to contemporary usage, with some attention to dialects and lexicography. *(Alternate years)*

ENGL 6163. Language Acquisition. (3) Prerequisite: ENGL 6160 or permission of the instructor. Linguistic theories of first and second language acquisition, including processes and stages of language development. *(Alternate years)*

ENGL 6166. Rhetorical Theory. (3) Rhetorical theories, past and present, focusing on ways that these varied frameworks of understanding have informed the generation, understanding, and pedagogy of writing and other modes of discourse. Emphases will vary from semester to semester, readings will concentrate on major selected rhetorical theories and on implications of these theories for the understanding and pedagogy of discourse. *(Yearly)*

ENGL 6195. Teaching College English. (3) Examination of major issues in the theory and practice of literature and composition instruction at the college level. *(Yearly)*

ENGL 6274. Contexts and Issues in the Teaching of English. (4) Prerequisites: Admission to the Program. Examine the key concepts of the discipline. Consider own identities as readers, writers, teachers, researches, makers of meaning. Emphasis upon critical approaches and pedagogical issues, with special attention to technology in the teaching of language, composition, and literature, as well as cultural contexts for the study of English. *(Fall) (Evenings)*

ENGL 6495. Internship in College Teaching. (3) Prerequisite: ENGL 6195. Teaching in one section offered by the English Department under the supervision of English faculty. Students will be accepted for internship only near the end of the degree program and upon approval of the department. Students will be assigned to teach selected basic courses, and also will participate in periodic conferences and seminars *(Fall, Spring)*.

ENGL 6674. Applied Research Methods in the Teaching of English. (4) Prerequisites: Completion of ENGL/EDUC 6274 and 12 hours of graduate credit toward this degree. Building on the research basis established in ENGL/EDUC 6274, this course provides the opportunity to apply research methods in classrooms. Examine identities as readers, writers, teachers, and especially as classroom researchers. *(Spring) (Evenings)*

ENGL 6680. Seminar in British Literature. (3) *(Yearly) (Evenings)*

ENGL 6685. Seminar in American Literature. (3) *(Yearly) (Evenings)*

ENGL 6890. Directed Reading. (1-3) *(Fall, Spring, Summer)*

ENGL 6974. Thesis/Project in the Teaching of English. (6) Research integrating the fields of English and Education in a theoretical or application-oriented study. If the thesis/project is the outgrowth of previous coursework, considerable additional research and exposition must be done. *(Department approval)*

ENGL 6996. Thesis. (6) Appropriate research and written exposition of that research, which may or may not be an outgrowth of work done in previous courses. If the thesis is the outgrowth of previous coursework, considerable additional research and exposition must be done beyond that previously undertaken. The proposed thesis work, as well as the final product, will be approved by a committee of three graduate faculty appropriate to the topic, appointed by the graduate coordinator after consultation with the student, on the basis of a written proposal from the student. It is recommended that thesis work not be undertaken until near the end of progress toward the degree. The thesis title is to be shown on the student's final transcript. A Creative thesis option is available for students who have completed appropriate coursework in Creative Writing. (A statement of recommendations and requirements for form and procedures is available in the English Department office.) *(Fall, Spring, Summer)*

GEOGRAPHY

Department of Geography and Earth Sciences

448 McEniry Building
(704) 547-2294
http://www.uncc.edu/colleges/arts_and_sciences/geoearth/

Degree

M.A.

Coordinator

Dr. Gerald L. Ingalls

Graduate Faculty

Craig Allan, Associate Professor
John Bender, Professor
Andy Bobyarchick, Associate Professor
Harrison Campbell, Jr., Assistant Professor
John Diemer, Associate Professor
Randall Forsythe, Associate Professor
Owen Furuseth, Professor
David Hartgen, Professor
Isaac Heard, Jr., Adjunct Professor
Gerald Ingalls, Professor
Sallie Ives, Associate Professor
Dennis Lord, Professor
Susan Marshall, Associate Professor
Walter Martin, Assistant Professor
Tyrel Moore, Associate Professor
Heather Smith, Assistant Professor
John Sommer, Professor
Alfred Stuart, Professor Emeritus
Wayne Walcott, Associate Professor
Wei-Ning Xiang, Associate Professor

Program of Study

The MA in Geography at UNC Charlotte emphasizes the application of geographic skills, methods, and theory to problem solving in contemporary society. To this end, students are offered a solid foundation in research methods, problem formulation and solution, quantitative methods, computer applications and GIS. Faculty and students are active in the community and students are encouraged to cap their programs with either funded or unfunded internships in the private or public sector.

One of the program's greatest strengths is the close relationship between its students and faculty and amongst the students themselves. Small class sizes, close student

and faculty contact and a strong sense of community are considered essential components of the learning and teaching environment at UNC Charlotte.

The applied geography program at UNC Charlotte is recognized as one of the best of its kind in the country. Many of its graduates have gone directly into jobs as professional geographers, research and/or marketing specialists, location analysts, planners, transportation specialists, and private consultants. About 10 percent of the more than 180 graduates of the program have gone on to study in Ph.D. programs.

Additional Admission Requirements

It is the policy of the department to provide equal opportunities to all students regardless of race, creed, color, sex, or national origin. The department maintains slightly different requirements than the general requirements for admission to graduate study at UNC Charlotte. The department requires applicants to demonstrate evidence of suitability for the program. Applicants are evaluated in the five major areas listed below. Each of these areas are weighted equally during the evaluation of applicants.

All applications for admission to the Community Planning track will be reviewed by the Community Planning Track Interdisciplinary Entrance Committee. All other applications for admission will be reviewed by the Geography and Earth Sciences Graduate Advisory Committee. The department will admit applicants on a competitive basis as space in the program allows and grant exceptions to the minimum standards already mentioned as deemed in the best interests of the program.

A) Grade Point Average (GPA): In general the department would prefer an overall GPA above 3.1 (or a 3.1 for the last 2 years) and a GPA of 3.2 in the major. However, averages less than these minimums will not exclude applicants if the other elements of the application are strong.

B) Letters of Recommendation: Three letters of reference are required. Letters from college or university teachers who have worked with and/or taught applicants are preferred. These letters will be evaluated on the basis of how well the applicant is suited in terms of intellect, motivation and temperament to do graduate course work.

C) Personal Essays: Applicants must write a personal essay which directly addresses why they wish to do graduate work in geography, why they wish to participate in the MA Program at UNC Charlotte and what they wish to do with the degree they would obtain. They should address directly how the program at UNC Charlotte fits their career and/or professional goals and how they would benefit from and contribute to the MA in Geography at UNC Charlotte.

This essay is very important in determining the applicant's commitment to graduate education and to a professional career in geography or a related field. Careful consideration of what goes into this essay is time well spent.

D) Scores on the Graduate Record Exam: In general the Department would prefer scores in the range of 1000 or more on the combined Verbal and Quantitative portions of the GRE. Again, scores less than these suggested minimums will not automatically exclude applicants if the remainder of the applicant's file is strong.

E) Transcripts of College Course Work: The transcripts will be evaluated on the basis of types of courses attempted, range of geography, statistical and computer course work attempted. Not only will the applicant be evaluated on the strength of the performance in these areas, but also on the range, depth and suitability of the preparation of the applicant for graduate level course work.

F) Additional Requirements for International Applicants: Applicants whose native language is not English must demonstrate their proficiency in English by taking the Test of English as a Foreign Language (TOEFL) examination. Overall scores of 575 with scores of 55 on individual sections (listening comprehension; structure and written expression; vocabulary and reading comprehension) are preferred.

Prerequisite Requirements

Minimum Preparation Suggested for Students Entering the Program:

All prospective graduate students must demonstrate competence in undergraduate subject matter in their area of study. While the department does not require that applicants have a degree in Geography or Earth Science, prospective graduate students should provide evidence that they are prepared to immediately take full advantage of graduate level course work in Geography and Earth Sciences.

Students applying for a concentration in *Location Analysis, Urban-Regional Analysis, Community Planning or Transportation* should, at a minimum, be familiar with the concepts and materials offered in courses such as basic Economic Geography, Introduction to Spatial Analysis or Introduction to Human Location Theory and Introduction to Research Methods or Statistics.

The minimum relevant courses for the *Environmental Analysis* concentration are Earth Science-Geography or Physical Geography and Earth Science-Geology or Physical Geology. In addition, applicants must have basic preparatory course work in meteorology, climatology or hydrology which are the primary areas of study within the Environmental Track.

Any student wishing to pursue additional training in *GIS* should have basic cartography preparation and introduction to computer use. The relevant courses at UNC Charlotte are Maps and Graphs and Cartographic Lab.

These courses are considered basic for admission to the UNC Charlotte Masters of Arts in Geography Program. Consequently, a student will normally not be considered prepared for graduate study without equivalent course work. Any student passing the above courses with a grade of B or better at UNC Charlotte or the equivalent courses from another university with a grade of at least B will not be judged deficient in these courses and will not be denied entry based solely on a lack of preparation. All judgments in this area are the responsibility of the Graduate Advisory Committee, the Community Planning Interdisciplinary Committee, and the department Chair.

Degree Requirements

The M.A. in Geography requires a minimum of 36 semester hours of graduate work. Three specific courses (12 semester hours) are required of all students except those in the Community Planning Track. Of the remaining 24 hours, a minimum of 12 hours must be completed at the 5000 or 6000 level. Up to 12 hours may be taken in related work which includes all transfer credit, credit by exam, coursework in other departments and courses taken at the 5000 level. At the discretion of the department, transfer credit totaling up to 6 hours may be accepted from accredited universities. No student may take more than 6 hours in graduate level independent study (GEOG 6800). The specific requirements are:

Required Courses (for all except the Community Planning Track)

GEOG 6100 Quantitative Analysis in Geography (3)
GEOG 6200 Research Design Fundamentals (3)
GEOG 7900 Individual Research Project (6)

Elective Courses

1) Other 5000 or 6000-level courses in Geography and Earth Sciences--a minimum of 12 hours
2) Related work (outside the Department) or transfer credits in courses numbered 5000 and above-maximum of 12 semester hours.

Total: 36 semester hours

Admission to Candidacy Requirements

Should be completed upon successful completion of a minimum of 18 semester hours of graduate work and in no case later than four weeks prior to the beginning of the semester in which student expects to complete all requisites for the degree. Form should be forwarded to Graduate School.

Assistantships

Assistantships are more like a part-time job for the student. Since we try to find work settings that fit the student's academic interest, these "jobs or assistantships" can also offer valuable training opportunities and work experience. The nature of the work will depend entirely on the needs of the client and the training and background of the student. UNC Charlotte faculty are seldom involved in directing the student working in an assistantship. The student, in effect, works for the client.

Graduate assistantships are arranged for either one entire semester or for an entire academic year (2 semesters or 9 months). They are normally scheduled for 16 weeks per semester and the student works 20 hours per week. Assistantships are funded at the rate of $4,500-$5,000 per semester. The Department makes every effort to provide funding to every full-time student in the program.

Track Descriptions

Students may elect to study in one or a combination of four concentrations and one track. The concentrations are location analysis, urban-regional analysis, transportation studies, and environmental analysis and assessment. The University's interdisciplinary Community Planning Track is housed within the MA in Geography.

Location Analysis

Overview

The location analysis concentration offers course work in:

retail location	applied population analysis
facility siting	office and industrial location
trade area analysis	real estate development
location research	regional economic development

This concentration prepares students for jobs in location research with retail companies, real estate developers, consulting firms, commercial banks, and economic development agencies or for continued academic training in economic geography and location analysis.

Course Work

The following courses are suggested for a concentration in location analysis:

GEOG 5155	Retail Location (3)
GEOG 5255	Applied Population Analysis (3)
GEOG 6000	Selected Topics in Economic Geography (3)
GEOG 6030	Topics in Geographic Techniques (3)
GEOG 6101	Store Location Research (3)
GEOG 6102	Site Feasibility Analysis (3)

Urban-Regional Analysis

Overview

Students in the urban-regional analysis concentration normally pursue course work in one of the following areas:

community development	regional development
GIS based analysis	site feasibility
public facility siting	impact analysis

Students normally gain employment in public sector community development and planning as well as the private sector.

Graduates of the MA in Geography program hold positions in a number of local and regional agencies in North Carolina and South Carolina as well as in other states such as Connecticut, Florida, Georgia, Kentucky, New York, and Washington. They have responsibility for a broad range of development issues and tasks including economic development, geographic information systems, housing, land use, community and neighborhood analysis, open space, recreation, and planning administration. Job placement for graduates has been very successful.

Course Work
Students normally choose courses from among the following for a concentration in urban-regional analysis:

GEOG 5120 Introduction to Geographic Information Systems (4)
GEOG 5130 Advanced Geographic Information Systems (4)
GEOG 5210 Urban Planning Methods (3)
GEOG 5255 Applied Population Analysis (3)
GEOG 6005 Topics in Urban Geography (3)
GEOG 6005 The Restructuring City (3)
GEOG 6015 Topics in Regional Geography (3)
GEOG 6020 Topics in Environmental Studies (3)
GEOG 6106 Urban Planning: Theory and Practice (3)
GEOG 6615 Spatial Decision Support Systems (3)

Transportation Studies
Overview
Students in the transportation studies concentration can pursue course work in transportation systems analysis, policy formulation, impact analysis, and planning. This concentration prepares students for jobs in the public and private sector, usually as planners in the public sector and as analysts for transportation providers and for consulting companies in the private sector. An extensive laboratory provides hands on research and practicum opportunities in a GIS setting.

Job Prospects
Graduates with this concentration in transportation studies have taken positions with local planning agencies, consulting firms, and transit management companies across North Carolina and the U.S.

Course Work
The following courses comprise the transportation studies concentration:

GEOG 5040 Transportation Topics (3)
GEOG 5160 Geography of Transportation Systems (3)
GEOG 5260 Transportation Policy Formulation (3)
GEOG 5265 Transportation Analysis Methods (3)
GEOG 5270 Evaluation of Transportation Impacts (3)

In addition, selected course work offered by the Civil Engineering and Marketing Departments is available for students in this program. Additional course work is available through GEOG 6800, Directed Problems, and a capstone, Individual Research Internship Project, GEOG 7900.

Environmental Analysis And Assessment
Overview
The environmental track encompasses two traditional earth science concentrations -- hydrologic processes and atmospheric studies -- and one interdisciplinary focus which includes environmental assessment and planning. The focus is interdisciplinary in nature and draws upon the expertise of practicing professionals as well as diverse Earth Science and Geography Department faculty. Each of these concentrations is integrated into the department's GIS technology and supported by field and laboratory equipment, including a computer-satellite linked system that provides access to current weather data, and GIS based hydrologic modeling software (GEOSTORM).

Job Prospects
Job prospects have been very good with students obtaining employment in local and state planning and environmental protection departments as well as private geotechnical and environmental consulting firms.

Course Work
Courses currently being offered in the environmental track include:

ESCI 5000 Selected Topics (1-4)
ESCI 5140 Hydrologic Processes (4)
ESCI 5145 Hydrogeology (3)
ESCI 5150 Climatology (3)
ESCI 5155 Fluvial Processes (4)
ESCI 5170 Remote Sensing (4)
ESCI 5180 Digital Image Processing in Remote Sensing (4)
ESCI 5222 Watershed Science (3)
ESCI 5400 Internship in Earth Sciences (3-6)
ESCI 5800 Individual Study in Earth Science (1-4)
ESCI 6060 Earth Sciences Field Investigations (1-6)
GEOG 6020 Topics in Environmental Studies (3)
GEOG 6025 Topics in Physical Geography (3)
GEOG 6030 Topics in Geographic Techniques (3)

Community Planning
The Community Planning Track is structured to provide students with grounding in planning skills, methods and theory, and practical experience for careers in community planning. The track comprises an interdisciplinary curriculum. Core requirements and approved electives are listed below:

Curriculum - Required hours 36 semester hours

Core coursework (21 hours, required of all students)
GEOG 5210 Urban Planning Methods (3)

GEOG 6040/
ARCH 6050 Community Planning Workshop (3)
GEOG 6100 Quantitative Analysis in Geography (3
GEOG 6106 Urban Planning: Theory and Practice (3)
ARCH 5214 Dilemmas of Modern City Planning (3)
ECON 6250 Advanced Urban and Regional Economics (3)
MPAD 6128 Public Policy Analysis and Program Evaluation (3)

Elective Coursework (minimum 9 hours) from the following:
GEOG 5120 Introduction to Geographic Information Systems (4)
GEOG 5130 Advanced Geographic Information Systems (4)
GEOG 5255 Applied Population Analysis(3)
GEOG 5260 Transportation Policy Formulation (3)
GEOG 5265 Transportation Analysis Methods (3)
GEOG 5270 Evaluation of Transportation Impacts (3)
ARCH 6050 The Architecture of Settlements (3)
ARCH 6050 Public Spaces in Cities (3)
ARCH 6050 Urban Transit and City Form (3)
ARCH 7103/
7104 Urban Design Problems (Topical Studio) (5)
MPAD 6102 Legal and Institutional Foundations of Public Administration (3)
MPAD 6131 Public Budgeting and Finance (3)

Capstone Research Project (6 hours, required of all students)
GEOG 7900 Individual Research Project (6) (taken in final semester)

Internship

The MA in Geography at UNC Charlotte emphasizes the application of skills, methods and theory to problem solving. Given this focus, the Internship often is a critical, capstone element of many students' programs and normally replaces the traditional thesis as the capstone project of a graduate program. As such, the nature of internship tasks normally involve the students in a higher level of independent problem solving than the normal assistantship might. Assistantships are more like part-time jobs. Internships are somewhat like consulting contracts.

An internship project normally involves a student in the execution of a substantive research task for a private or public sector client. While a research project always involves some oversight and direction from UNC Charlotte faculty and the client, the student is the primary investigator and has the major responsibility for a specific "real world" research task or research question.

Internships may involve work executed within the client's work setting requiring the intern to report for work at a pre-established schedule or they may be less structured and more task oriented. The type of work setting will depend entirely on the client preference and the nature of the internship problem or task.

Internships normally last three to five months. In the Internship, the student can work more than 20 hours per week. The student normally is paid somewhere between $1,200 and $2,000 per month depending on the nature of the task undertaken and the estimated time involved. The student can be paid directly by the client or the client may contract with the university to pay the student.

Normally somewhere between 8-10 students are involved in internships at any given time. Some students opt for more traditional, thesis style capstones to their academic program.

Given the applied thrust of the department it is our intent to have as many graduate students as possible complete an internship--either funded or unfunded. However, for a variety of reasons it may not always be possible or advisable to arrange an internship: it may be in the best interests of the student, given individual career goals and program interests to complete a thesis; it may not be possible to locate a sponsor whose needs fit the interests of the student; a student's advisor may recommend against placing a student in an internship; a special situation may not allow a student to be employed.

Advising

Upon admission to the program each student will be assigned a faculty advisor from the student's declared area of interest. This advisor will help guide the student through the design and implementation of program of study tailored to the student's specific needs and career goals. The advisor will generally be available to the student for advice on academic and other problems. Students must confer with their advisors regularly concerning academic matters.

More often than not, students will not work with the same advisor throughout the entire program. Once the student has become familiar with the program and the faculty, it is possible to change advisors by obtaining prior approval from the faculty member with whom the student wishes to work. Advisors should be chosen to match, as nearly as possible, the student's academic and career interests. No student will be allowed to register for a class without the signature of their "official" advisor.

All students are required to formulate a complete plan for their MA by the end of their first semester. This plan must be approved by their advisor and will serve as a guide to their course of study while at UNC Charlotte.

Transfer Credit

As many as six semester hours of course work may be accepted for transfer from other accredited institutions upon approval of the student's advisor, the departmental Graduate Advisory Committee, and the Dean of the College of Arts and Sciences. Course credit may also be

earned by examination. The specific arrangements for this procedure must be made through the advisor and the course instructor. The total of all transfer credits, credits earned through examination, and related work together may not exceed 12 credit hours.

Comprehensive Examination

To complete the program, each student must pass a two part comprehensive examination covering both general aspects of the discipline and in defense of the individual research project. It is the responsibility of the advisor in consultation with the student to arrange each of the exams. In every instance, before either part of the exam can be administered, every member of the graduate faculty of the department must receive written notification.

The Written Exam - Part 1 of the comprehensive is a written exam in which the student must respond to questions submitted by the faculty. These questions are solicited from the entire graduate faculty of the department by a memo sent by student's advisor who then administers the examination. The written comprehensive exam is normally taken during the third semester (for full-time students) and in no case should the student take this exam before accumulating 27 hours of completed course work including courses in progress. This exam may not be administered if the student has outstanding incomplete grades in any course work.

The Defense of the (GEOG 7900) Individual Research Project - Part 2 of the comprehensive exam is the defense of the individual research project (7900)--the thesis or internship report. This exam is generally administered at the discretion of the advisor and the student. When the advisor is satisfied that the student's research and writing has progressed sufficiently the research document is provided to the other members of the independent research committee; if they agree that the document is ready for a defense, an exam is scheduled. The advisor must then notify, in writing, every member of the department's graduate faculty of the date, time, place and the topic (title with abstract) of the defense.

Committees

Selection of the GEOG 7900 Research Project Committee: All GEOG 7900 Research Projects are evaluated by a committee of faculty. Committees must have a minimum of three members composed of the graduate faculty of the department--or related departments. Additional members are acceptable and in many cases outside members, other departments or internship coordinators from off-campus agencies, are advisable. The advisor and the student shall select one of the two other department members.

Thesis

A common research experience is not appropriate for all students. Instead, students should pursue research experiences that are appropriate to departmental faculty resources, individual student's programs, and the availability of opportunities that exist to work with allied agencies or clients on or off campus. One of three options, depending on the previously stated stipulations, will be available: 1) a research experience similar to that of a traditional academic thesis; 2) a research experience which involves a paid internship funded by and arranged with a public or private agency or client; and 3) a research experience involving an internship that is not funded, but arranged with a public or private agency or client. Each of these options fulfills program requirements equally. Each will produce a finished, quality research effort of thesis quality.

Not every student can expect to engage in a paid internship because the number of students frequently exceeds a matching number of opportunities funded in that manner. Unpaid internships provide the same caliber of experience and training in an applied environment. In some cases, that experience may relate student with non-profit agencies or social services that simply do not have the resources to fund an internship. In either case, the topic of the internship is defined by the client's problem or needs.

Not every student can expect to develop the thesis option, but it does provide a choice for the student to pursue a research problem in a direction of his/her individual interest. Students who ultimately plan to pursue a Ph.D. degree might be more inclined and encouraged toward that option. The same is true of students who wish to complete their master's program with that kind of individual research activity. In all cases, students must work closely with their advisor and program committee to choose the option which best fits both their particular program and prevailing circumstances.

Courses in Geography, Earth Sciences and Geology

Geography:

GEOG 5040. Transportation Topics. (3) Prerequisite: consent of department. Investigation of special topics in transportation including: transit systems, mobility and travel patterns, land use/transportation interface, air pollution, and information systems. *(Spring) (Alternate years)*

GEOG 5101. Cartographic Techniques. (3) Prerequisite: GEOG 2100. Preparation of maps, figures and charts at a professional level of competence. Techniques to be emphasized include desktop mapping with computers, high resolution imagesetting output, color separation techniques which include computer separations as well as scribing and various related photographic processes. Two laboratories of three hours each per week. *(Spring)*

GEOG 5102. Cartographic Design and Map Construction. (3) Design process and basic map construction techniques with particular emphasis on the graphic elements of map design, planning map design, creating visual hierarchies, the uses of color, and basic mechanical color separation. *(Fall)*

GEOG 5103. Computer Mapping. (3) Prerequisites: GEOG 2100 and CSCI 1100 or 1201 and its lab, or consent of instructor. Automated methods of gathering, storing, manipulating and displaying spatial data. Emphasis on the use of existing software and the design and implementation of geographic data structures and algorithms. *(Spring)*

GEOG 5120. Introduction to Geographic Information Systems. (4) Prerequisite: consent of instructor. Development, current state-of-the-art and future trends in geographic information processing with emphasis on data gathering, storage, and retrieval, analytical capabilities and display technologies. A laboratory component will include development and completion of an applied GIS research project. Additional requirements for graduate credit. Three lecture hours, one two-hour lab per week. *(Fall)*

GEOG 5130. Advanced Geographic Information Systems. (4) Prerequisite: GEOG 5120 or consent of instructor. Advanced GIS study with emphasis on (1) advanced skills for database development and management; (2) spatial analysis and modeling; and (3) Macro language programming and user interface design. Three lecture hours and a two-hour lab session each week. *(Spring)*

GEOG 5155. Retail Location. (3) Spatial attributes of retailing and related activities. Location patterns, store location research, trade area delineation and consumer spatial behavior. *(Spring)*

GEOG 5160. The Geography of Transportation Systems. (3) Geographical and human factors that affect the movement of goods and people from place to place. Emphasis on transportation routes and networks, commodity flow patterns and the locational implications of freight rates. *(Spring)*

GEOG 5210. Urban Planning Methods. (3) Prerequisite: GEOG 5205 or consent of the instructor. Scope and methods of urban planning. Emphasis on analytical techniques, projections, and data sources used in developing comprehensive planning tasks and strategies. *(Fall)*

GEOG 5255. Applied Population Analysis. (3) Population data sources; measuring population change; elementary projection and estimation techniques; spatial sampling; migration; survey design; applications in the public and private sectors. *(Fall)*

GEOG 5260. Transportation Policy Formulation. (3) Prerequisite: consent of department. Structure of transportation policy at federal, state, and local levels including policies concerning highway financing and investments, congestion, safety, and use and development, energy, transit, and the provision of intercity services. *(Fall) (Alternate years)*

GEOG 5265. Transportation Analysis Methods. (3) Prerequisite: consent of department; statistics recommended. Procedures for analyzing the operation and performance of transportation systems; includes network planning models, minimum path algorithms and assignments; energy, air pollution, and activity analysis models; and research approaches, data sources, time and activity budgets, infrastructure condition and needs assessment. *(Spring) (Alternate years)*

GEOG 5270. Evaluation of Transportation Impacts. (3) Prerequisite: consent of department. Methods and case studies for evaluating impacts and benefits of transportation investments including site-level impact analysis; project, corridor, and area scales; multi-modal evaluation and examination of mutually exclusive alternatives. *(Fall) (Alternate years)*

GEOG 5405. Urban Field Geography. (6) Prerequisite: six hours of urban-related undergraduate courses or permission of instructor. Intensive field studies of cities of the Carolinas, including one-day and overnight trips to cities of the mountains and coastal areas. Emphasis on day study trips within the Piedmont. Exercises include land-use mapping, trip journals, interviews and comparisons of the results of zoning and urban development practices within satellite cities of the Charlotte Metropolitan Statistical Area. *(Summer)*

GEOG 6000. Topics in Economic Geography. (3) Major topics in the location of economic activity. May be repeated for credit as topics vary. *(Yearly) (Evenings)*

GEOG 6005. Topics in Urban Geography. (3) Major topics in the form and structure of urban areas examined generally and in a specific local occurrence. May be repeated for credit as topics vary. *(Yearly) (Evening)*

GEOG 6010. Topics in Political Geography. (3) Major topics in the spatial aspects of political systems with special emphasis on urban and regional spatial patterns examined generally and in a specific local occurrence. May be repeated for credit as topics vary. *(On demand)*

GEOG 6015. Topics in Regional Geography. (3) Intensive examination of major spatial questions in a given region. May be repeated for credit as topics vary. *(On demand)*

GEOG 6020. Topics in Environmental Studies. (3) Major topics concerning the physical environment with

emphasis on pollution problems in urban areas examined generally and in a specific local occurrence. May be repeated for credit as topics vary. *(Yearly) (Evenings)*

GEOG 6025. Topics in Physical Geography. (3) Major topics in physical geography examined generally and in a specific local occurrence. May be repeated for credit as topics vary. *(Yearly) (Evenings)*

GEOG 6030. Topics in Geographic Techniques. (3) Cartographic, remote sensing, quantitative techniques or field techniques. May be repeated for credit as topics vary. *(On demand)*

GEOG 6100. Quantitative Analysis in Geography. (3) Multiple regression, trend surface, factorial analysis, cluster analysis, discriminant analysis. *(Fall) (Evenings)*

GEOG 6101. Store Location Research. (3) Prerequisite: GEOG 6100 or consent of instructor. Market area analysis and site evaluation methods, including the application of multivariate statistical models, spatial interaction-gravity models, and location-allocation techniques to the retail location analysis task. *(Spring)*

GEOG 6102. Site Feasibility Analysis. (3) Prerequisite: consent of instructor. Examination of factors affecting the feasibility of land parcels for commercial and residential development with emphasis on the physical evaluation of a given site, the market support for its intended use and the financial support for the proposed development. *(Fall)*

GEOG 6106. Urban Planning: Theory and Practice. (3) Alternative planning theories and application of theories in urban planning practices. *(Alternate years)*

GEOG 6110. Cartographic Preparation and Analysis. (3) Cartographic design and analysis of qualitative and quantitative data. Emphasis on preparation of maps, figures and charts. Techniques include scribing and various photographic processes. Two three-hour labs each week. *(On demand)*

GEOG 6200. Research Design Fundamentals. (3) Scientific research and problem solving. Problem identification, bibliographic search, data sources and collection, techniques selection and preparation of reports and proposals. *(Spring) (Evenings)*

GEOG 6201. Analysis and Presentation of Research Data. (3) The student is required to complete a research project. Topics such as research critiques, preparation and presentation of research reports, and the development of geographic thought are considered. *(Fall) (Evenings)*

GEOG 6600. Seminar in Geography. (3) Study of the current trends in geographic thought and research methods. *Pass/No Credit* grading. *(On demand)*

GEOG 6615. Advanced Seminar in Spatial Decision Support Systems (SDSS). (4) Prerequisite: GEOG 4120 or 5120 or consent of instructor. Theoretical aspects of spatial DSS including technical, social, political and psychological consideration; systems design; systems manipulation; and case studies. Three hours of lecture and one two-hour lab per week. *(Fall)*

GEOG 6800. Directed Problems in Geography. (1-4) Individual research into geographic topics. May be repeated one time. *(On demand)*

GEOG 7900. Individual Research Project. (6) Individual research report based on directed study of a topic of geographic significance. *Pass/No Credit/ Unsatisfactory* grading. *(Fall, Spring)*

Earth Science:

ESCI 5000. Selected Topics in Earth Sciences. (1-4) Prerequisites: ESCI 1101, GEOL 1200-1200L, or permission of the instructor. In-depth treatment of specific topics selected from one of the fields of the earth sciences. May be repeated for credit as topics vary. *(On demand)*

ESCI 5140. Hydrologic Processes. (4) Prerequisite: ESCI 1101 or GEOL 1200-1200L. Atmospheric, soils and geologic aspects of surface and ground water processes. Three lecture hours and one three-hour lab per week. *(Fall)*

ESCI 5150. Applied Climatology. (3) Prerequisite: ESCI 3250 or consent of instructor. Methods of acquiring and analyzing climatic data in various types of applied problems. Emphasis on methods to assess and reduce the impact of weather and climate upon human activities. *(Spring)*

ESCI 5155. Fluvial Processes. (4) Hydrologic and geomorphic study of the transport of water and earth materials within stream systems. Erosion, mass wasting, open channel flow, sediment transport, flooding, stream channel morphology, morphometry of drainage basins, and related topics. Three lecture hours, three lab hours per week. *(Spring)*

ESCI 5170. Fundamentals of Remote Sensing. (4) Prerequisite: ESCI 1101 and GEOL 1200, or consent of the instructor. Physical fundamentals of remote sensing and overview of airborne and satellite systems operating in the visible, infrared, and radar regions, and a review of applications for resource exploration, environmental studies, land use and land cover analysis, and natural hazards. One 2-1/2 hour lecture, and one three-hour lab per week. *(On demand) (Evenings)*

ESCI 5180. Digital Image Processing in Remote Sensing. (4) Prerequisite: ESCI 5170 or consent of instructor. Scientific and computational foundations of digital image processing techniques for extracting earth

resource information from remotely sensed data. Three lecture hours and three lab hours per week. *(Spring)*

ESCI 5222. Watershed Science. (3) Prerequisites: M.A. Geography students: ESCI 5140 or 5155 or GEOL 5145. Examination of the cycling of water and chemical elements in natural and perturbed watersheds with emphasis on linkages between the hydrologic and biogeochemical processes which control runoff water quality. Topics include runoff processes, evapotranspiration, nutrient export and stream, riparian and hyporheic zone hydrochemical dynamics. *(Spring)*

ESCI 5400. Internship in Earth Sciences. (3-6) Prerequisite: consent of the Department. Research and/or work experience designed to be a logical extension of a student's academic program. The student must apply to Department for an internship by submitting a proposal which specifies the type of work/research experience preferred and how the internship will complement his or her academic program. The Department will attempt to place the selected students in cooperating community organizations to complete specified research or work-related tasks which are based on a contractual arrangement between the student and community organization. The student can receive three to six hours credit, depending on the nature and extent of the internship assignment. *(On demand)*

ESCI 6060. Earth Sciences Field Investigations. (1-6) Prerequisite: consent of instructor. A concentrated field investigation of selected earth sciences topics. Course subject matter, credit hours, location and duration will be specified each time course is offered. May be repeated for credit. *Pass/No Credit* grading. *(On demand)*

ESCI 6650. Workshop in Geography. (4) A series of lectures on the subject matter of the atmosphere and hydrosphere with accompanying laboratory sessions. *(On demand)*

ESCI 6800. Individual Study in Earth Sciences. (1-4) Prerequisite: permission of the Department and credit hours established in advance. Tutorial study or special research problems. May be repeated for credit as topics vary. *(On demand)*

Geology:

GEOL 5000. Topics in Geology. (1-4) Prerequisites: ESCI 1101, GEOL 1200-1200L, or permission of the instructor. In-depth treatment of specific topics selected from one of the fields of geology. May be repeated for credit as topics vary. *(On demand)*

GEOL 5100. Igneous and Metamorphic Petrology. (4) Prerequisite: GEOL 3115. Classification, mineralogy and chemical properties of igneous and metamorphic rocks including the tectonic processes by which they formed. Lab emphasizes hand specimen and petrographic description and interpretation of rocks in thin sections. *(Alternate years)*

GEOL 5105. Geomorphology. (3) Prerequisite: ESCI 1101; GEOL 1200 and 1200L. Surficial processes and landform development as controlled by climate, tectonics, rock characteristics and time with emphasis on plate tectonic, weathering, erosion, mass wasting, surface water, groundwater, glacial, wind coastal processes and climate change in landscape development. *(Fall) (Alternate years)*

GEOL 5105L. Geomorphology Laboratory. (1) Prerequisite or co-requisite: GEOL 5105. Analysis of landforms and the surficial processes responsible for landform development. One lab period of 3 hours per week. *(Fall) (On demand)*

GEOL 5110. Stratigraphy. (4) Prerequisites: GEOL 1210 and 3124. Vertical and horizontal relationships of layered earth materials as a key to understanding basin history, past depositional environments and their transformation through time. Three lecture hours, three lab hours per week. *(Spring)*

GEOL 5115. Applied Geophysics. (4) Prerequisites: GEOL 3115, 3130 and introductory physics or consent of instructor. Instrumental analysis of the earth's physical parameters. Study of human-induced seismic and electrical signals, and natural magnetic and gravitational fields for the purposes of locating faults, ore bodies, ground water and other earth hazards or resources. Three hours of lecture and one two-hour lab per week. *(On demand)*

GEOL 5120. Geologic Mapping and Interpretation. (4) Prerequisites: GEOL 3130 and 5100 or consent of instructor. Field and lab oriented study using principles of mineralogy, petrology and structural geology. Involves collection and resolution of field data, techniques of presenting data, development of geologic maps, and critical reviews of existing literature. Two hours of lecture, four hours of lab/field work per week. *(Alternate years)*

GEOL 5125. Geologic Summer Field Camp. (6) Prerequisite: Consent of instructor. Concentrated field investigation of geologic features. Data collection in the field, geologic mapping, report and map preparation and time management. Location of field camp will be specified each time course is offered. *(Summer)*

GEOL 5130. Optical Mineralogy. (4) Prerequisite: GEOL 3115. Light optics theory, the behavior of plane polarized light in a solid medium. The laboratory emphasizes the use of petrographic microscope oil immersion techniques and identification of the common rock forming minerals. Three hours of lecture and one three-hour lab per week. *(Spring)*

GEOL 5135. Tectonics. (4) Prerequisite: GEOL 3130 or consent of the instructor. A systematic examination of the evolution and dynamics of the earth from the perspective of plate tectonics theory. Three lecture hours, one three-hour lab per week. *(Alternate years)*

GEOL 5145. Fundamentals of Hydrogeology. (3) Prerequisites: GEOL 1200, CHEM 1252 or consent of instructor. Physical and chemical principles of ground water including the framework of ground water within the geologic and hydrologic cycles, its exploitation and protection as a natural resource, and its importance as a resource in the southeastern United States. *(On demand) (Evenings)*

GEOL 5145L. Hydrogeology Laboratory. (1) Prerequisites: GEOL 1200, CHEM 1252, MATH 1242, PHYS 1101 and GEOL 5145 (or corequisite) or consent of instructor. Ground water investigation and analysis. Topics include storage of water in rocks, movement and chemical evolution of ground water, and assessment of regional ground water conditions. One three-hour lab per week. *(On demand) (Evenings)*

GEOL 5165. Aqueous Geochemistry. (4) Prerequisites: CHEM 1251 and 1252 and GEOL 3115, or consent of instructor. Interaction of rocks, minerals, and gases with water under natural conditions, including an overview of the compositions of natural waters from a variety of environmental and geologic settings emphasizing a rigorous thermodynamic approach to understanding water-rock interactions. Three hours of lecture, three hours of lab per week. *(Fall)*

GEOL 6800. Individual Study in Geology. (1-4) Prerequisite: Permission of the Department and credit hours established in advance. Tutorial study or special research problems. May be repeated for credit as topics vary. *(On demand)*

GEOL 6651. Workshops in Geology. (4) A series of lectures on subject matter of the lithosphere and space science with accompanying laboratory sessions. *(On demand)*

GERONTOLOGY

Interdisciplinary Program in Gerontology

103 Macy Building
(704) 547-4312
http://www.uncc.edu/geront

Degree and Credential

M.A. (Concentration in Planning and Administration), Certificate

Director and Coordinator

Dr. Dena Shenk

Graduate Faculty

Dana Bradley, Assistant Professor
Paul Foos, Professor
Elise Fullmer, Associate Professor
Gloria Hagopian, Professor
JoAnn Lee, Associate Professor
William J. McAuley, Associate Dean
Jane Neese, Associate Professor
James Peacock, Assistant Professor
Gary Rassel, Assistant Professor
Dorothy Ruiz, Associate Professor
Dena Shenk, Professor
Randy Swanson, Associate Professor
Shirley Travis, D.W. Colvard Distinguished Professor
Diane Zablotsky, Associate Professor

GERONTOLOGY

Master of Arts

The Master of Arts in Gerontology is designed to prepare graduates with the knowledge and skills to fill a wide variety of positions in the developing field of aging. The Planning and Administration Concentration will best meet the needs of those planing to direct programs for older adults, and those interested in the development and administration of programs.

Potential students are encouraged to apply to begin the program in the fall semester, although applications are reviewed throughout the year. The program can be completed on either a full-time or part-time basis with all required courses and a selection of electives offered in the evening. Some courses may require prerequisites and it is the responsibility of the candidate to meet any prerequisites (e.g. statistics is a required prerequisite for GRNT 6201). Students will work in conjunction with their adviser and graduate committee to design and implement their individual program.

Additional Admission Requirements

Grade point average of at least 2.75 overall and 3.0 in courses in Gerontology.
Satisfactory GRE or MAT scores.
Three letters of recommendation from persons familiar with the applicant's personal and professional qualifications.
Essay describing the applicant's relevant experience and objectives in undertaking graduate study in Gerontology.

Prerequisite Requirements

Completion of at least one broad-based undergraduate course in Gerontology or the Professional Development Program in Gerontology previously offered through the

Office of Continuing Education, Extension and Summer Sessions at UNC Charlotte.

Degree Requirements
The Gerontology Program requires 36 semester hours of graduate course work.

Core Courses (required, 21 hours)

GRNT 6600	Current Issues in Gerontology (3)
SOCY 6130	Sociology of Aging: Theories and Research (3)
PSYC 6124	Psychology of Aging (3)
NURS 6275	Health Promotion and Wellness for Older Adults (3)
GRNT 6201	Research and Methods in Aging I (3)
GRNT 6202	Research and Methods in Aging II (3)
GRNT 6400	Practicum (3)

Thesis or Applied Project

In addition to these core courses, students will complete either:
The thesis option entails 9 hours of elective credits and 6 hours of thesis credits. The student must also pass an oral defense of both the thesis proposal and thesis, and oral comprehensive exams at the time of the thesis defense.

The applied project option entails 15 hours of elective courses. Three elective credits will generally be earned for the Applied Project, taken as GRNT 6800, Independent Research Study. The student must also pass an oral defense of both the applied project proposal and the project, and oral comprehensive exams at the time of the project defense.

Elective courses (will include)

GRNT 5050	Topics in Gerontology (1-4)
GRNT 5250	Programs and Services for the Aging (3)
GRNT 6800	Independent Research Study (3 can be repeated, up to 6 credits can be counted towards MA electives)
GRNT 6210/ MPAD 6210	Aging and Public Policy (3)
GRNT 6211/ MPAD 6211	Administration of Aging Programs (3)
HPKD 5232	Physiology of Human Aging (3)
MPAD 6128	Public Policy Analysis and Program Evaluation (3)
MPAD 6172	Administration of the Health Care System in the U.S. (3)
NURS 6115	Health Planing in the Health Care System (3)
SOCY 5134	Families and Aging (3)
SOCY 5150	Older Individual and Society (3)

Committee

Each student should select his/her Graduate Committee before completion of GRNT 6201.

GERONTOLOGY

Graduate Certificate

The Graduate Certificate in Gerontology is designed to provide graduate education in Gerontology for those who already have a graduate degree in another field or those currently completing a graduate degree in another field, who are interested in working with older adults. It requires completion of a set of core and elective courses related to the study of aging. Applications for admission the Graduate Certificate Program in Gerontology will be considered as they are received and admissions will be ongoing. Students are admitted to the Graduate School in a special category for certificate students.

Additional Admission Requirements

In addition to the general requirements for admission to a certificate program, applicants must provide official transcripts of all baccalaureate and graduate work attempted.
Three letters of recommendation are required from persons familiar with the applicant's personal and professional qualifications.

Degree Requirements

The Graduate Certificate Program requires completion of a minimum of 15 semester hours of graduate course work related to aging and older adults.

Core Course

GRNT 6600	Current Issues in Gerontology (3)

Electives

Primary Electives (choose 2-3 of the following):

PSYC 6124	Psychology of Aging (3)
SOCY 6130	Sociology of Aging: Theories and Research (3)
NURS 6275	Health Promotion and Wellness for Older Adults (3)

Secondary Electives (choose 1-2 from the following):

GRNT 5050	Topics in Gerontology (1-4)
GRNT 5250	Programs and Services for the Aging (3)
GRNT 6210/ MPAD 6210	Aging and Public Policy (3)
GRNT 6211/ MPAD 6211	Administration of Aging Programs (3)
HPKD 5232	Physiology of Human Aging (3)
MPAD 6128	Public Policy Analysis and Program Evaluation (3)
MPAD 6172	Administration of the Health Care System in the U.S. (3)
NURS 6115	Health Planing in the Health Care System (3)
SOCY 5134	Families and Aging (3)
SOCY 5150	Older Individual and Society (3)

Secondary electives may also be chosen from other appropriate courses as offered with the approval of the Gerontology Graduate Coordinator.

Transfer Credit

Transfer credit is not accepted toward a Graduate Certificate Program in Gerontology.

Courses in Gerontology

GRNT 5050. Topics in Gerontology. (1-4) Investigation of specific issues in Gerontology, either from the perspective of a single discipline or from a multidisciplinary perspective. May be repeated for credit as topics vary. *(On demand)*

GRNT 5250. Aging Programs and Services. (3) Examination of federal, state and local framework of services and programs for the aging. Graduate students required to complete a more extensive final paper and to present their project presentation as a grant proposal. *(On demand)*

GRNT 5260. Women: Middle Age and Beyond. (3) Position of older women in society and the particular problems and issues for women as they age. (Same as WMST 5260) *(On demand)*

GRNT 5270. Intergenerational Relationships & Programs. (3) Exploration of the importance of and consequences of intergenerational relationships and the range of programming currently available to encourage interaction between people of different ages. *(On demand)*

GRNT 6600. Current Issues in Gerontology. (3) Study of current issues and topics in the field of aging from an interdisciplinary perspective; an ethical framework will be used to examine the issues. *(Fall)*

GRNT 6201. Research and Methods in Aging I. (3) Prerequisite: Statistics. Examination of variety of qualitative and quantitative methods used in research on aging and analysis of Gerontology research from a range of disciplines. Students will develop a working draft of their thesis-applied project proposal. *(Spring)*

GRNT 6202. Research and Methods in Aging II. (3) Prerequisite: GRNT 6201. Examination of the variety of qualitative and quantitative methods used in evaluation research in applied settings. Students will develop an evaluation project plan. Gerontology students will also refine their thesis/applied project proposal. *(Fall)*

GRNT 6238/PHIL 6238. Intergenerational Issues of Justice. (3) Examination of intergenerational issues of justice in public policy toward the elderly and their health care needs. Issues of justice and morality will be explored in terms of the distribution of limited health care resources among competing age groups. *(On demand)*

GRNT 6210/MPAD 6210. Aging and Public Policy. (3) Examination of the public policy making process with attention to aging policy. Consideration of determinants of aging policy and institution and actors in the policy making process and piecemeal development of legislation will be analyzed as factors related to the making of policy for the aged. *(Alternate years)*

GRNT 6211/MPAD 6211. Administration of Aging Programs. (3) Focus will be implementation of public policies and programs for the aged and the development and administration of these programs. Students will become familiar with the process through which policies are transformed into aging programs and the budgetary, management and evaluative considerations that must be taken into consideration. *(Alternate years)*

GRNT 6400. Practicum. (3) Completion of a field-based educational experience which relates to the student's career goals and objectives. Pass/Fall grading. *(Summer)*

GRNT 6600. Current Issues in Gerontology. (3) Study of current topics and issues in the field of Gerontology from an interdisciplinary perspective. An ethical framework will be used to examine the issues. *(Fall)*

GRNT 6800. Independent Research in Gerontology. (3) Graduate students meet individually or in small groups with the instructor and will complete readings and/or research on a topic in gerontology according to a contract. Attendance at lectures of an undergraduate class in Gerontology may be included among course requirements. May be repeated for credit up to a maximum of six hours. *(On demand)*

GRNT 6999. Master of Arts Thesis. (3 or 6) Prerequisite: application for admission to the thesis option. A completed paper and oral presentation are required. Pass/Fall grading. *(Fall, Spring, Summer)*

GRNT 7999. Master of Arts Thesis Residency. (1) Pass/Fail grading. *(Fall, Spring, Summer)*

HEALTH ADMINISTRATION

Department of Health Administration

103 Macy Building
(704) 547-4520
http://www.uncc.edu/gradmiss/hltadmas.htm#gen

Degree

M.H.A.

Director
Dr. Carolyn R. Thompson

Graduate Faculty
William Brandon
Carole Jurkiewicz
Gerald Pyle
Linda Swayne
Carolyn Thompson
Rosemarie Tong
Jennifer Troyer

Program of Study
The Master of Health Administration prepares administrators for a variety of health related institutions in an evolving health care delivery system. Structured to meet the professional standards of the Accrediting Commission on Education for Health Services Administration (ACEHSA), the program is designed to address the needs of current health care managers, clinical professionals who anticipate future administrative responsibilities and pre-professionals who wish to prepare for an entry level career in health care administration.

The Master of Health Administration is a 45 hour degree program divided into required foundation, functional and capstone courses and elective courses. Administratively located within the Graduate School, it is an intercollegiate and interdisciplinary program with courses taught by faculty from the College of Arts and Sciences, the Belk College of Business Administration and the College of Nursing and Health Professions. Each course in the curriculum is specifically designed to meet the needs of this program, with an emphasis on issues of health services administration.

Students may enroll in the Master of Health Administration program on a full time or part time basis. Classes are scheduled in the evenings and on weekends at both the UNC Charlotte main campus and at UNC Charlotte Uptown.

Prerequisites
There are no prerequisites for admission to the program; however, several courses have individual prerequisites. They are noted in the individual course descriptions.

Additional Admission Requirements
To be considered for admission to graduate study in Health Administration, a student must present the following requirements in addition to those required by the Graduate School:

1) Overall grade point average of 3.0 on all previous post secondary course work.
2) Acceptable scores on the verbal and quantitative portions of the Graduate Record Exam or the Graduate Management Admission Test or the Miller Analogies Test.
3) An essay describing the applicants experience and objective in undertaking graduate study.
4) Three evaluations from persons familiar with the applicants personal or professional qualifications.
5) There are co-requisites for several courses within the curriculum. These co-requisites do not need to be completed before submitting an application for admission.
6) Basic computer skills including word processing and use of spread sheets.

Applicants with records of high quality professional experience who do not fulfill these formal requirements should discuss with the Director of the Health Administration Program other factors that may have a bearing on admission.

Courses
Each student is required to complete 36 hours (12 courses) in the core curriculum. These courses offer a basic body of knowledge, skills and values relevant to health services administration. These courses are divided into three areas: foundation courses, functional courses and a capstone course. While students may take courses within an area in any order, each area provides a knowledge base for subsequent courses. It is advisable to finish all courses within an area and proceed sequentially to the next grouping of courses. Additionally, students will select 9 credit hours (3 graduate courses) in elective studies. A student may choose to use two elective courses to complete a thesis. Students are encouraged to select courses that meet individual professional needs. Electives are available in several areas, including management specialties, gerontology, community health and non-profit organizations.

Internships
Each student in the program is required to demonstrate professional experience in the health care delivery system. This requirement may be demonstrated through 1) a full time position in a health care delivery setting or 2) an approved internship in a health care delivery setting. Students who have no professional experience in a health care setting are required to undertake an internship experience. Each student must complete an MHA Internship Information form, describing professional experience or internship preference, and submit it to the MHA office. Students who elect an internship may register for HADM 6800 (Independent Study) on a pass/fail basis

Core Courses (33 hours)
Foundation Courses

HADM 6103	Health and Disease (3)
HADM 6112	Introduction to US Health Care Systems (3)
HADM 6114	Economics of Health Policy (3)
HADM 6123	Accounting for Health Care Management (3)

Functional Courses

HADM 6125 Finance in Health Care Administration (3)
HADM 6130 Health Law and Ethics (3)
HADM 6141 Research Methods for Health Care Administration (3)
HADM 6145 Organization Theory for Health Systems (3)
HADM 6147 Human Resource Management (3)
HADM 6152 Information Resource Management (3)
Capstone Course
HADM 6166 Strategic Management of Health Services Organizations (3)

Capstone Experience

HADM 6166, Strategic Management of Health Services Organizations, is the capstone course in the curriculum and incorporates the comprehensive examination.

Electives

Students will enroll in four elective courses. Students are encouraged to select courses that will complement their professional interest and educational goals. Elective courses are offered each semester by the Health Administration program or may be selected from other graduate programs to meet particular interest.

Advising

The Program Director will advise all MHA students.

Comprehensive Examination

Each student must successfully complete a comprehensive examination designed to test the knowledge and skills presented within the core curriculum. This examination is administered as part of a final presentation in the capstone course.

Thesis

Students may elect a two-course thesis sequence to produce and defend independent research relevant to health services administration that demonstrates a contribution to professional knowledge through systematic investigation. This course requires permission of the graduate faculty member who would direct the study as well as permission of the MHA coordinator prior to registration.

MHA/MSN Dual Degree

The College of Nursing and Health Professions and the Master of Health Administration program offer an integrated curriculum leading to a dual degree, both the MHA and the MSN. Applicants must hold a B.S.N. degree and must be admitted to both programs. The program is described in detail under graduate programs in the College of Nursing and Health Professions

Courses in Health Administration

HADM 6103. Health and Disease. (3) Prerequisite HPKD 6223. Principles and methods of epidemiology including definitions and models of health, illness and disease; modes of transmission of clinically important infectious agents; risk factors and chronic diseases; and insights into existing studies and paradigms of health promotion and disease prevention (Same as HPKD 6189) *(Spring) (Evenings)*

HADM 6112. Introduction to the US Health Care System. (3) Overview of health care delivery in the United States including organizational structures, financing mechanisms and delivery systems, with particular attention to program formation. (Same as MPAD 6172) *(Spring) (Evenings)*

HADM 6114. Economics of Health Policy. (3) Prerequisite HPKD 6223. Examination of the economic context of health care policy and application of economic concepts to the health care sector including supply and demand, elasticity, regulation, competition and cost effectiveness analysis. *(Spring) (Evenings)*

HADM 6123. Accounting for Health Care Management. (3) Basic concepts and techniques of collecting, processing and reporting financial information relevant to health care institutions. Emphasizes a conceptual understanding of financial accounting, technical tools of cost accounting, including budget preparation and analysis, and interpretation of financial statements. (Prerequisite: undergraduate accounting course) *(Spring) (Evenings)*

HADM 6125. Finance in Health Care Administration. (3) Prerequisite: HADM 6123. Fundamental financial management concepts and tools for health care institutions, including financial statements and attributes, capital acquisition and allocation, investment analysis, capital and cash flow management and contractual relationships. *(Fall) (Evenings)*

HADM 6127. Health Policy Development. (3) Examination of the formulation, adoption and implementation of public policy for health care through federal, state and local political processes. (Same as MPAD 6174) *(On demand) (Evenings)*

HADM 6130. Health Law and Ethics. (3) Analysis of ethical and bioethical problems confronting health care delivery systems. Selected legal principles and their application to the health care field, including corporate liability, malpractice, informed consent and governmental regulation of health personnel and health facilities. *(Spring) (Evenings)*

HADM 6135. Managed Care Systems. (3) Fundamentals of managed health care systems, including risk arrangements, compensation, incentives, quality assurance, financing and public programs.*(On demand) (Evenings)*

HADM 6133. Trends and Issues in Health Administration. (3) Examination of current issues confronting health care managers and an assessment of programs and management responses to emerging trends in the health care field, including delivery systems, marketing/competition, financing and /or epidemiological changes. (Same as MPAD 6176)*(On demand) (Evenings)*

HADM 6141. Research Methods for Health Care Administration. (3) Prerequisite: HPKD 6223. Study of selected statistical techniques useful in the analysis of managerial decisions and interpretation and evaluation of research. Introduction to systems analysis and selected operations research techniques as applied to problem solving and decision making in health care institutions. *(Fall) (Evenings)*

HADM 6145. Organization Theory and Health Care Management. (3) Introduction to organizational theory with applications to health care systems, including organizational design and interorganizational networks/alliances. Examination of communication and leadership skills development, including conflict, labor and dispute management. *(Fall) (Evenings)*

HADM 6147. Human Resources Management. (3) Examines human resources management as it applies to health services institutions, including compensation benefits, personnel planning, recruitment, selection, training and development, employee appraisal and discipline, union-management relations and quality management. *(Fall) (Evenings)*

HADM 6152. Information Resources Management. (3) A study of the use of information management to improve the delivery of health care. Information resource management includes methods and practices to acquire, disseminate, store, interpret and use information to provide health care in a more efficient, effective and economical manner. Emphasis is placed upon information as central to the ongoing operations and strategic decisions of health care organizations. (Same as NURS 6162)*(Fall) (Evenings)*

HADM 6000. Topics in Health Administration. (3) Intensive study of a topic in health administration. The topic of investigation may vary from semester to semester. May be repeated for credit.*(On demand) (Evenings)*

HADM 6166. Strategic Management of Health Services Organizations. (3) Analysis of strategic planning, managing and marketing concepts, techniques and tools within the health care industry, including organizational capability analysis, competitor and environmental analysis and business plan development. *(Spring) (Evenings)*

HADM 6800. Independent Study. (1-3) Guided individual study in an issue related to health administration arranged with a faculty member or supervised experience in an administrative setting in a program or entity within the health care delivery system. (Pass/Fail) *(On demand)*

HADM 6999. Thesis. (3) Production of independent research relevant to health administration which demonstrates contribution to professional knowledge through systemic investigation. Pass/In Progress grading

HADM 7999. Graduate Residence. (0) Prerequisite: 6999. Continuation of thesis on a topic of significance in health administration.

HEALTH PROMOTION

Department of Health Promotion and Kinesiology

Belk Gym
(704) 547-4695
http://www.uncc.edu/colleges/health/hpk/pages/grad.htm

Degree

M.S.

Coordinator

Dr. Mike Turner

Graduate Faculty

Linda Berne, Professor
Rita DiGioacchino, Assistant Professor
J. Timothy Lightfoot, Associate Professor
Gerald Pyle, Professor
Lynne Tingle, Assistant Professor
Michael Turner, Assistant Professor

Program of Study

The Masters of Science in Health Promotion is designed to allow students to become Health Promotion specialists by fulfilling the basic requirements of the MS along with specialty courses within the students' interests. Students guide their studies by selecting a either a Practitioner or Researcher concentration and a specialty area of emphasis. The specialty areas consist of Clinical Exercise Physiology, Community Health, Substance Abuse Prevention, or Worksite Health Promotion. The series of core courses, selection of a concentration, and a specialty area provide experiences useful for employment in

various settings such as health related agencies and organizations, hospitals, health departments, corporations with worksite wellness programs, fitness centers, and/or insurance companies.

Prerequisite Requirements

Undergraduate Statistics course and Healthy Lifestyles (or equivalent overview of health course) for all students. Anatomy and Physiology is required for students pursuing the Clinical Exercise Physiology specialty area.

Assistantships

The department has two assistantship positions that last for two years. These positions are set up such that each year one position is available for incoming students. Assistantships through grant funding are available on an on-going basis and exist over different time schedules.

Program of Study

Core Courses

- HPKD 5299 Epidemiology (3)
- HPKD 6120 Philosophy and Practice of Health Promotion (3)
- HPKD 6141 Health Promotion Administration (3)
- HPKD 6143 Behavior Change in Health Promotion (3)
- HPKD 6222 Health Promotion Analysis (3)
- NURS 6160 Research Methods in Nursing and Health Professions (3)

Concentration Courses (select one)

Practitioner

- HPKD 6145 Health Promotion Planning and Evaluation (3)
- HPKD 6250 Methods in Health Promotion and Education (3)
- HPKD 6886 Health Promotion Project (3)

Researcher

- HPKD 6223 Advanced Data Analysis in Health Promotion (3)
- HPKD 6224 Health Promotion Measurement (3)
- HPKD 6900 Research and Thesis in Health Promotion (3)

Specialty Areas (select one)

Clinical Exercise Physiology

- HPKD 5134 Assessment and Development of Fitness (3)
- HPKD 5232 Physiology of Aging (3)
- HPKD 5292 Advanced Athletic Training (3)
- HPKD 6280 Advanced Exercise Physiology (3)
- NURS 6220 Pharmacotherapeutics in Advanced Nursing (3)

Community Health

- HPKD 5122 Drugs and Society (3)
- HPKD 5126 Adolescent Sexuality (3)
- HPKD 5128 Environmental Health (3)
- HPKD 6160 Community Health (3)
- HPKD 6279 International Health (3)

Worksite Health Promotion

- HPKD 5120 Mental and Emotional Well-Being (3)
- HPKD 5130 Applied Nutrition (3)
- HPKD 5134 Assessment/Development of Fitness (3)
- HPKD 5232 Physiology of Aging (3)
- HPKD 6153 Worksite Health Promotion (3)

Substance Abuse Prevention

- HPKD 5122 Drugs and Society (3)
- CSLG 6160 Theories of Chemical Dependency (3)
- CSLG 6161 Chemical Dependence: Assessment and Diagnosis (3)
- CSLG 6162 Techniques of Chemical Dependency Counseling (3)
- CSLG 6163 Treatment, Planning and Relapse Prevention (3)

Capstone Experiences

1) There is a Health Promotion Project for the Practitioner Concentration
2) There is a Research Thesis for the Researcher Concentration

Transfer Credit

Permission Granted on an Individual Basis

Committees

Health Promotion Project Committee for the Practitioner Concentration
Research Thesis Committee for the Researcher Concentration

Thesis

Required in the Research Concentration

Research Opportunities/Experiences

A variety of research experiences are available for students. Each specialty area has research opportunities either within the Department of Health Promotion and Kinesiology or in Clinical/Community settings, depending on the students' interests.

Tuition Waivers

Available with some grant funded assistantships

Program Certifications/Accreditations

The Clinical Exercise Physiology specialty area meets the guidelines for Clinical Exercise Physiology programs from the American College of Sports Medicine.

Courses in Health Promotion

HPKD 5120. Mental and Emotional Well-being. (3) Examines mental and emotional health from the perspective of the health educator's role as a facilitator of mental and emotional wellness. *(2 year cycle)*

HPKD 5122. Drugs and Society. (3) Teaching methodology, knowledge and skills for affecting appropriate behaviors through the study of use, misuse and abuse of natural and synthetic chemicals in today's society. *(On demand)*

HPKD 5124. Safety Through the Life Span. (3) Prerequisite: consent of the department. Introduction to accident/injury prevention emphasizing personal responsibility for health care with a focus on psycho-social development and a wellness approach to safety management. *(On demand)*

HPKD 5126. Adolescent Sexuality and Family Life Education. (3) Designed for teachers, counselors, school nurses, administrators and others responsible for family life education programs in school, with focus on adolescent sexuality issues. *(2 year cycle) (Summer)*

HPKD 5128. Environmental Health: A Global Perspective. (3) Teaching methodology, knowledge and skills for affecting appropriate health behaviors through study of the causes and effects of contemporary environmental problems. *(On demand)*

HPKD 5130. Applied Nutrition for Today's Consumer. (3) Principles of nutrition, dietary guidelines, dietary relationships to diseases and health, special populations, computerized dietary analysis. *(2 year cycle)*

HPKD 5134. Assessment and Development of Physical Fitness. (3) Prerequisite: consent of the instructor. Study of responses and adaptations to exercise, assessment techniques, exercise prescription, leadership and programming. *(2 year cycle)*

HPKD 5136. Health Product and Service Consumerism. (3) Teaching methodology, knowledge and skills for affecting appropriate health behaviors through emphasis on the individual consumer at the health marketplace. *(On demand)*

HPKD 5204. Perceptual Motor Development. (3) Theories, principles and research related to perceptual motor development of children. *(On demand)*

HPKD 5205. Perceptual Motor Learning. (3) Prerequisite or corequisite: HPKD 5204 or consent of instructor. Perceptual-motor learning of children and its effect on school performance and the relationships of perceptual-motor development to reading, writing and mathematics. *(On demand)*

HPKD 5208. Perceptual Motor Therapy. (3) Prerequisite: HPKD 4205 or consent of the instructor. Observation of and evaluation and therapy for children with perceptual-motor delays. *(On demand)*

HPKD 5210. Perceptual Motor Therapy Laboratory. (1) HPKD 5204 or 5205 or 5208. *(Fall, Spring)*

HPKD 5211. Perceptual Motor Therapy Laboratory. (2) Prerequisites/corequisite: HPKD 5204 or 5208. *(Fall, Spring)*

HPKD 5212. Perceptual Motor Therapy Laboratory. (3) Prerequisite: HPKD 5208, 5210, or 5211 and permission of instructor. Supervised observation, testing and clinical teaching of children with perceptual-motor dysfunction.

HPKD 5232. Physiology of Human Aging. (3) This course focuses on the normal physiological alterations that occur as the human progresses from a young adult to the latter stages of life. Special attention is given to interventions commonly promoted to combat the physiological changes that result from aging. *(Every 2 Years)*

HPKD 5292. Clinical Athletic Training. (3) Advanced study of the clinical applications of common therapeutic modalities and rehabilitation in the treatment of athletic related injuries. *(Every 2 years)*

HPKD 5299. Epidemiology. (3) Prerequisite: permission of the instructor. Traditional aspects of epidemiology, including practical disease concepts, epidemiological measures of health status, mortality and morbidity rates and ratios, descriptive statistics, research design, cohort studies, case-control studies, and prospective and retrospective analysis. *(Fall)*

HPKD 6120. Philosophy and Practice in Health Promotion. (3) Philosophies, modalities and arenas of practice in health promotion; role delineation, professional development, advocacy and ethics. *(Fall)*

HPKD 6141. Health Promotion Administration. (3) Management and leadership, strategic planning, grant proposal writing, staffing, staff development and program coordination in health promotion settings. *(Spring)*

HPKD 6143. Behavior Change in Health Promotion. (3) Assessment and modification of health behaviors. *(Spring)*

HPKD 6145. Health Promotion Planning and Evaluation. (3) Designing, implementing and evaluating health promotion/education programs within work site, school and community settings. *(Fall)*

HPKD 6151. Coordinating the School Health Education Program. (3) Examines the school health education program from the perspective of the school health education coordinator. *(On demand)*

HPKD 6153. Worksite Health Promotion. (3) Prerequisite: consent of the instructor. An exploration of

the practices of promoting health in various setting for a variety of consumers. *(Yearly)*

HPKD 6155. Health Risk Reduction and Disease Prevention. (3) Personal/professional management of risk factors and lifestyle intervention processes for leading causes of mortality and morbidity. *(On demand)*

HPKD 6160. Community Health. (3) The nature and delineation of communities as social systems; principles and practices relevant to community health. *(Yearly)*

HPKD 6189. Community Epidemiology. (3) Principles and methods of epidemiology including definitions and models of health, illness and disease; modes of transmission of clinically important infectious agents; risk factors and chronic diseases; and insights into existing studies and paradigms of health promotion and disease preventions. (Same as HADM 6103) *(Spring)*

HPKD 6222. Health Promotion Analysis. (3) The purpose of this course is to teach students data analysis techniques used in health professions. Students will understand data in terms of proper analysis techniques, perform various types of data analyses using various software applications, interpret results, and communicate results orally and in writing. *(Spring)*

HPKD 6223. Advanced Data Analysis in Health Promotion. (3) Prerequisite: HPKD 6222. The purpose of this course is to educate students on advanced statistical and data analysis techniques used in health professions. Additionally, this course is designed to increase students' ability to use health related computer software. *(Every 2 years)*

HPKD 6224. Health Promotion Measurement. (3) Prerequisite: HPKD 6222: The purpose of this course is to educate students on applied measurement techniques used in the health sciences. The skills obtained from this course will be useful in health related program evaluations, testing of models of health theories, development of health surveys, health needs assessments. It includes an exploration of methods of establishing reliability and validity estimates as modeled by Classical Test Theory, Item Response Theory, and through the use of Structural Equation Modeling with Health Theories. *(Every 2 years)*

HPKD 6250. Methods in Health Promotion and Education. (3) Corerequisite: HPKD 6120, HPKD 6143, or permission of instructor. Instructional pedagogy and health promotion methods based on the ecological model of health including strategies directed at policy, community, institutional, inter-and intra-personal levels. *(Fall)*

HPKD 6279. International Health. (3) Principles and methods of studying international health, including historical background, sources and problems associated with health data, the social context, the role of government and non- government agencies, health in relation to environment and development, international health projects, defining the international health sector, infectious disease problems, and the practice of international health. *(Every 2 years)*

HPKD 6280. Advanced Exercise Physiology. (3) Prerequisite: HPKD 2280 or similar coursework. Advanced study of the functioning of physiological systems during exercise with emphasis on current literature and research. *(Every 2 years)*

HPKD 6471. Seminar and Internship in Health Education. (1-6) Prerequisites: Completion of 12 or more graduate credit hours in health education and permission of the health promotion program coordinator. Supervised practice in health education. May be repeated for a different seminar and internship. Offered only on a *Pass/No Credit* basis. *(Fall, Spring, Summer)*

HPKD 6899. Problems and Topics in Health. (1-6) Topics and special problems related to issues, practices or sufficient trends in health promotion. Institutes, workshops, seminars and independent studies. *(Fall, Spring, Summer)*

HPKD 6886. Health Promotion Project. (3) Prerequisite: completion of 36 hours toward the Health Promotion Master of Science Degree. A capstone synthesis course in which candidate applies needs assessments, program planning, implementing, and evaluation skills to a problem or an opportunity in a community health promotion setting with a target population. *(Every semester)*

HPKD 6900. Research and Thesis in Health Promotion. (3) Prerequisite: Satisfactory completion of NURS 6160; completion of at least 24 hours of graduate program; consent of instructor overseeing thesis research. Design, implementation, presentation, and evaluation of an approved research project in student's specialty area. The applied project is of the student's own design under the supervision of an advisor and graduate committee. Graded Pass/No Credit only. *(Every semester)*

HPKD 7999. Graduate Residence. (1) Independent research. Required of all master's degree students who are working on a thesis but not enrolled in other graduate courses. *(Fall, Spring)*

HISTORY

Department of History

113 Garinger Building
(704) 547-4633
http://www.uncc.edu/colleges/arts_and_sciences/history/

Degree

M.A., Ph.D. (joint degree with the University of Aberdeen)

Coordinator

Dr. Cynthia A. Kierner

Graduate Faculty (UNC Charlotte)

Mario Azevedo, Professor
Jürgen Buchenau, Assistant Professor
Kathleen Donohue, Assistant Professor
Daniel Dupre, Associate Professor
John Flower, Assistant Professor
Donna Gabaccia, Professor
David Goldfield, Professor
James Hogue, Assistant Professor
Lyman Johnson, Professor
Cynthia Kierner, Professor
Gregory Mixon, Assistant Professor
Daniel Morrill, Professor
Steven Sabol, Assistant Professor
John Smail, Professor
Heather Thompson, Assistant Professor

HISTORY

Master of Arts Degree

Program of Study

The Master of Arts Program in History at UNC Charlotte is designed to give motivated students an opportunity to pursue advanced studies in close collaboration with accomplished scholars. The program emphasizes the development of methodological, literary, and conceptual skills that graduates can employ as students in a doctoral program, as professional oriented history teachers in secondary schools, or as citizens more acutely aware of the historical evolution of their society. Offering both day and evening courses, the Department of History attracts a diverse group of traditional and non-traditional students. Candidates may pursue the M.A. degree on either a full-time or part-time basis.

The Department offers courses in African, Asian, European, Latin American, and United States history, with particular expertise in the following areas:
American Society--Private Life and Public Culture
American South, Old and New
Comparative Industrialization and Urbanization
European Culture and Politics, 1550-1950
Gender, Race, and Slavery in Comparative Perspective

The Department recently has begun offering Public History courses and anticipates the offering of a concentration in the field of Public History.

Admission Requirements

In addition to the general requirements for admission to the Graduate School, the following are ordinarily required for admission to the M.A. program in History:

1) A minimum undergraduate GPA of 3.0 in History or a related discipline.
2) Acceptable performance on the verbal and math portions of the GRE.

Degree Requirements

The Master of Arts degree in History requires completion, with a GPA of 3.0 or better, of at least 30 hours in approved graduate courses. These courses must include at least 24 credit hours in History, of which at least 15 hours are in seminars or colloquia open only to graduate students, and no more than 6 hours in individually designed readings or research courses.

Students must complete all degree requirements, including the comprehensive examination or thesis defense, within six calendar years of first enrollment in the program.

All students in the program are expected to maintain an overall B (3.0) average. Students who do not meet this expectation will be subject to suspension on recommendation of the Graduate Committee of the Department of History.

Admission to Candidacy Requirements

An Admission to Candidacy form must be submitted during the semester preceding the one in which the student plans to complete the degree requirements, either by defending a thesis or taking a comprehensive examination.

Assistantships

The Department of History supports approximately eight students with teaching assistantships, which are currently funded at $8,000 per year. The Department also has a modest pool of scholarship money for in-state students and one tuition waiver for out-of-state students. Assistantships and other financial aid are awarded on a strictly competitive basis.

In addition, students may obtain limited financial support for students internships, summer teaching in the Department, archival work in the library's special collections, and teaching opportunities at the local community college. Students doing thesis research may receive modest travel grants from the Department.

Internships

Internships may be available with the Mecklenburg County Historical Commission and the *Journal of Urban History*, both of which are headed by members of the Department of History. The Museum of the New South, located in uptown Charlotte, employs students for research and design. Students also may serve as research assistants for members of the Department of History. See the Graduate Coordinator for other research opportunities.

Core Courses

All candidates for the degree must complete HIST 6693 (Historiography and Methodology) with a grade of B (3.0) or better. In addition, at least 6 hours of a student's History courses are expected to pertain to fields other than United States history.

Electives

Students may elect to take up to 6 hours of graduate-level course work in disciplines other than History. Candidates seeking graduate-level teacher certification may use the elective option to take courses in professional education selected in consultation with the College of Education. If a student needs more than 6 hours to satisfy certification requirements, those hours will be added to the total required for the M.A. in History.

Advising

Students may not register for graduate-level courses without the permission of the Department of History. Consequently, students must be advised by the Graduate Coordinator prior to registering for courses each semester, as well as prior to filing their admission to candidacy form and application for degree.

Transfer Credit

No more than 6 transferred hours may be approved for application to the requirements for the degree.

Language Requirement

Although students are not required to demonstrate proficiency in a foreign language, they are expected to be able to use whatever languages they need to pursue their research interests.

Thesis/Comprehensive Examination

After completing the required courses, students must either prepare a Master's thesis based on original primary research or take comprehensive written examinations based on reading lists compiled in consultation with faculty members. In both cases, the candidate must then pass an oral examination based on their thesis or written examination.

An Examining Committee, consisting of two graduate faculty members from the Department of History and a third member selected from History or another department, oversees the student's thesis work or conducts the comprehensive written and oral examinations.

Courses in History

HIST 5000. Problems in American History. (3) Prerequisite: HIST 2100 or permission of the department. A colloquium designed around a problem in American history, requiring reading, discussion, reports and a major paper. May be repeated for credit as topics vary. *(Fall, Spring) (Evenings)*

HIST 5001. Problems in European History. (3) Prerequisites: HIST 2100 or permission of the department. A colloquium designed around a problem in European history, requiring reading, discussion, reports and a major paper. May be repeated for credit as topics vary. *(Yearly, Summer) (Evenings)*

HIST 5002. Problems in Non-Western History. (3) Prerequisite: HIST 2100 or permission of the department. A colloquium designed around a problem in non-Western history, requiring reading, discussion, reports and a major paper. May be repeated for credit as topics vary. *(Yearly)*

HIST 6000. Topics in History. (3) Intensive treatment of a period or broader survey of a topic, depending on student needs and staff resources. May be repeated for credit as topics vary. *(Fall, Spring) (Evenings)*

HIST 6196. Urban Systems for School Administrators. (3) Corequisite: POLS 6196. An interdepartmental, team-taught course which consists of a survey of the causes and consequences of urbanization in the United States with particular attention to the urban South.

Urbanization is treated as a system linking historic, political, economic, and social factors, particularly since 1945. *(Summer)*

HIST 6200. History Teaching Alliance Institute. (3) Open under special arrangement. Pass/No Credit grading only. *(On demand)*

HIST 6210. Early America, 1607-1820. (3) Development of American institutions from the period of English settlement through the establishment of Republicanism under the Constitution. *(Alternate years)*

HIST 6215. Jacksonian America, 1820-1848. (3) Examination of important economic, social and political changes including industrialization, the rise of the Democratic Party and reform movements. *(Alternate years)*

HIST 6220. The Old South. (3) Evolution of the Old South from the 17th century to its collapse in the Civil War and Reconstruction, focusing on southern distinctiveness and the tension between democracy and slavery. *(Alternate years)*

HIST 6225. The New South. (3) Continuity and change in the South from the late-19th century, including industrialization, politics, class and race relations, and religion. *(Alternate years)*

HIST 6230. European Social History. (3) Examination of the views of different writers on class formation, the rise of modern institutions, gender relations and social protest including why certain schools of thought such as modernization or Marxism become popular at particular historical moments. *(Alternate years)*

HIST 6240. U.S. Political and Economic History, 1865-1939. (3) Emergence of the modern industrial economy and the concomitant development of a large bureaucratic federal government including big business, technological innovation, the labor movement, progressive reform and regulatory policies. *(Alternate years)*

HIST 6250. Comparative Slavery and Race Relations. (3) Slavery in the New World through its abolition including Indian and African slaves, the slave trade, the economics of slavery, and the impact of slavery on modern race relations in the Americas. *(Alternate years)*

HIST 6265. Cold War America. (3) Domestic and foreign policy problems accompanying the post-World War II struggle between East and West, Communism and capitalism including McCarthyism, modern technology, foreign aid, Korea, Vietnam, civil rights, gender roles and natural resources. *(Alternate years)*

HIST 6601. Graduate Colloquium. (3) A colloquium focused on a theme or period. Assigned readings, short papers and reports directed toward developing research and writing skills. May be repeated for credit. *(Fall, Spring) (Evenings)*

HIST 6693. Historiography and Methodology. (3) A study of historians and their philosophical and methodological approaches. Required of all M.A. candidates. *(Yearly) (Evenings)*

HIST 6698. Introduction to Historical Writing. (3) Seminar on the process of thesis writing including thesis proposals, primary source materials, rules of evidence, structure of an argument, and organization of the thesis and its chapters. May be repeated for credit. *(On demand)*

HIST 6894. Readings in History. (3) Prerequisite: prior written consent of instructor. Coverage of historical periods or topics through individually designed reading programs; scheduled conference with a staff member. May be repeated for credit. *(Fall, Spring) (Evenings)*

HIST 6901. Directed Readings/Research. (3) Prerequisite: prior written consent of instructor and graduate coordinator. Graduate students will meet individually or in small groups with the instructor and will be assigned readings and/or research on a theme that relates to the lectures of an undergraduate class. Attendance at the lectures is a course requirement. May be repeated for credit. *(Fall, Spring, Summer)*

HIST 6997. Directed Research. (3) Prerequisite: prior written consent of instructor. Investigation of a historical problem culminating in a research paper. May be repeated for credit. *(On demand)*

HIST 6999. Thesis. (3 or 6) May be repeated by permission, if taken for three hours credit. Six hours of Thesis may be taken during a single semester. Appropriate research and written exposition of that research is required. *(On demand)*

HIST 7999. Master's Degree Residence. (1)

HISTORY

Doctor of Philosophy Degree

Graduate Faculty (at University of Aberdeen)

Mike Broers, Reader
Terry Brotherstone, Senior Lecturer
Christoph Dartmann, Lecturer
David Ditchburn, Lecturer
Paul Dukes, Professor
Marjory Harper, Senior Lecturer
Howard Hotson, Lecturer
Rene Leboutte, Professor
David Longley, Lecturer
Alastair Macdonald, Lecturer
Allan Macinnes, Professor
Andrew Mackillop, Lecturer
William Naphy, Lecturer
Jane Ohlmeyer, Senior Lecturer
Richard Oram, Lecturer
Frederik Pedersen, Lecturer
Richard Perren, Senior Lecturer
Edward Ranson, Lecturer
David Smith, Lecturer
Robert Tyson, Senior Lecturer
Rosemary Tyzack, Lecturer
Oonagh Walsh, Lecturer

Program of Study

This program combines the M.A. at UNC Charlotte, or an accepted institution, with a Ph.D. conferred by the University of Aberdeen in Scotland. After attaining their Master's degrees, qualified students will spend one year in Charlotte, one year in Aberdeen, and a third year at either of these two institutions. Ph.D. candidates will work with faculty and utilize research facilities in both America and Europe. Teaching and research assistantships are available on a competitive basis at both universities.

Both universities offer a wide range of courses and fields of specialization. As indicated above, the Department of History at UNC Charlotte possesses particular expertise in United States history, the history of the American South, and the comparative history of medicine, race, gender, urbanization, and industrialization. The Department of History at the University of Aberdeen possesses particular expertise in non-Anglocentric British history; the North Sea and Baltic states, including Russia; diet, disease, and death; gender; and the relationship between Scotland and America.

Additional Requirements for Admission

In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in History at the doctoral level:

1) A GPA of 3.5 or better in all Master's level courses.
2) Above average performance on the math and verbal portions of the G.R.E.
3) Submission of the applicant's M.A. thesis or a substantial research paper.
4) The student must complete applications to both UNC Charlotte and the University of Aberdeen.

Degree Requirements

The joint Ph.D. in History requires successful completion of a dissertation proposal, a qualifying examination, and a doctoral dissertation. Course work for the joint Ph.D. will consist primarily of directed reading and research in preparation for writing the dissertation.

All degree requirements, including the dissertation defense, should be completed in 3-4 years. All requirements must be completed within six years of enrolling in the program.

Assistantships

Teaching and research assistantships are available at both universities on a competitive basis. Applications for assistantships at UNC Charlotte should be submitted simultaneously with those for admission to the joint Ph.D. program.

Advising

Students may not register for graduate-level courses without the permission of the Department of History, which means that the graduate coordinator must register them for courses each semester. Regular advising by the graduate coordinator is especially essential to arrange continuous funding for doctoral students in Charlotte and in Aberdeen.

Qualifying Examination

Students are required to complete both written and oral qualifying examinations during their second semester at UNC Charlotte. The written examination will consist of a dissertation proposal; the oral examination will cover both the student's general field of specialization and the proposed dissertation topic.

Language Requirement

Although students are not required to demonstrate proficiency in a foreign language, they must possess the foreign language skills necessary to do primary research in their intended field of specialization.

Dissertation Defense

Doctoral dissertations are not to exceed 100,000 words in length. The dissertation defense is a final oral examination at which a student presents and defends his/her research before a committee of Aberdeen and UNC Charlotte faculty. The defense committee can reject the dissertation and instruct the student to revise the work or accept it and thereby confer the Ph.D.

Courses in History

(Doctoral students only)
HIST 8894. Readings in History. (3 or 6)
Prerequisite: doctoral student with prior written consent of the instructor. Coverage of historical periods or topics through individually designed reading programs; scheduled conferences with a designated member of the graduate faculty. May be repeated for credit. *(Fall, Spring, Summer)*

INFORMATION TECHNOLOGY

College of Information Technology

Kennedy Building
(704) 547-3119
http://www.sit.uncc.edu

Degree

Certificate, M.S., and Ph.D.

Coordinator

Dr. Bei-Tseng (Bill) Chu

Graduate Faculty

C. Michael Allen, Professor
Haldun Aytug, Associate Professor
Joanna Baker, Professor
M. Maureen Brown, Assistant Professor
Keh-Hsun Chen, Associate Professor
Bei-Tseng Chu, Professor
W. Douglas Cooper, Professor
Essam El-kwae, Assistant Professor
John Gretes, Professor
Mirsad Hadzikadic, Associate Professor
Moutaz Khouja, Associate Professor
Ram Kumar, Associate Professor
Junsheng Long, Associate Professor
Zbigniew Michalewicz, Professor

Taghi Mostafavi, Associate Professor
Joseph Quinn, Professor
Zbigniew Ras, Professor
Hassan Razavi, Associate Professor,
Gyorgy Revesz, Professor
Stephanie Robbins, Associate professor
Cem Saydam, Professor
Mike Smith, Assistant Professor
Anthonis Stylianou, Associate Professor
Kalpathi Subramanian, Associate Professor
William J. Tolone, Assistant Professor
Robert Wilhelm, Associate Professor
A. Barry Wilkinson, Professor
Susan Winters, Assistant Professor
Wei-Ning Xiang, Associate Professor
Jing Xiao, Associate Professor
Jan Zytkow, Professor

INFORMATION TECHNOLOGY

Graduate Certificate

Please refer to the Information Technology Website listed previously.

INFORMATION TECHNOLOGY

Master of Science Degree

At the time of publication, the M.S. in Information Technology had just been approved. Below is the information on the program that was available at that time. Please refer to the Website listed previously for additional information.

Program of Study

The educational objectives of this proposed MS in IT are the following:

1) To provide graduates with the requisite IT knowledge to compete in today's profit, non-profit, and government organizations.
2) To provide an understanding of the integration of technology, policy, and business with flexibility to specialize in an area of interest (e.g., e-commerce, data mining, system integration, information security)
3) To integrate cutting edge IT knowledge and theory with applications useful for the industry.

The program, with the selection of appropriate concentrations, can provide background knowledge for the following types of positions:

System analyst
Application software developers (including web-based application development)
Database designer/developers
Information security specialist
Web-site developer / manager
Information system architect
IT project manager

Additional Admission Requirements

Admission requirements for the proposed program include:

1) A bachelor's degree, or equivalent.
2) All applicants must meet the requirements for admission to the Graduate School of UNC Charlotte.
3) Applicants will be expected to have completed undergraduate course work, or equivalent, in a programming language and in data structures with a minimum grade average of 3.0 on a 4.0 scale.

Admission is competitive, with preference given to applicants with strong credentials and appropriate undergraduate and/or professional preparation.

Documents to be submitted include the following:

1) Transcript showing a baccalaureate degree.
2) A satisfactory score on the aptitude portion of the GRE or GMAT.
3) A written description of any relevant and significant work experience.
4) (If the applicant's native language is not English), an overall score of 575 (old system) or 230 (new computer-based examination) in the Test of English as a Foreign Language TOEFL), with scores of at least 55 (20 on the new examination) on the individual sections (listening comprehension; structure and written expression; vocabulary and reading comprehension).

Degree Requirements

Required Courses (30 hours)

MBAD 6121	Business Information Systems (3)
MBAD 6124	Business Information Systems Development (3)
MBAD 6125	Business Data Communications (3) *or*
CSCI 5160	Applied Databases (3)
CSCI 5166	Network-based Application Development (3)
CSCI 6177	Systems Integration (3)
ITSC 6342	Project Management
ITSC 6198	IT Project (Prerequisites: Completion of the above six courses)

The student must also complete a three-course (nine credit hours) sequence in an approved concentration area. Examples of approved concentration areas are listed below.

Advanced Databases and Knowledge Discovery Concentration.

The purpose of this concentration is to provide graduate students with the opportunity to reach a demonstrated level of competence in the area of databases and

knowledge discovery. The students will be introduced to the theory, techniques and applications of modern data bases and data analysis.

Students will take the following three courses:

CSCI 6160	Database Systems, Design and Management (3)
CSCI 6162	Knowledge Discovery in Databases (3)
CSCI 7163	Data Warehousing (3)

b) **Management Concentration**
This concentration focuses on the management issues associated with the development and application of emerging technologies. The courses in the option address strategic decision factors, communications, technology entrepreneurship, and individual and group behavior dynamics.

Students can choose three of the following courses:

MBAD 6161	Organizational Leadership & Behavior (3)
MBAD 6164	Executive Communication (3)
MBAD 6191	Entrepreneurship (3)
MBAD 6195	Strategic Management of Technology (3)

Marketing Concentration
This concentration focuses on the marketing issues associated with electronic commerce. The courses in the option address e-commerce from a technology base as well as a marketing perspective. It focuses on integrating information technology with marketing analysis, strategies, and issues important in becoming competitive in today's new wired global marketplace.

Students will take:

ITSC 7352	Information Technology and Electronic Commerce (3)
MBAD 6171	Marketing Management (3)

And choose one of the following:

MKTG 6010	Internet Marketing (3)
MKTG 6020	Information Technology in Marketing (3)

d) **Financial Services Concentration**
This concentration focuses on applications in the financial services industry that are heavily dependent on information technology. The courses address a wide range of applications in commercial banking, investment banking, corporate finance, derivatives, portfolio management, and risk management.

Students may choose three courses from the following list:

MBAD 6058	Special Topics in Financial Services (3)
MBAD 6151	Financial Institutions & Markets (3)
MBAD 6153	Investment Management (3)
MBAD 6156	Commercial Bank Management (3)
MBAD 6157	Theory of Corporate Finance (3)

Courses in Information Technology – Master's

ITSC 6313. Reading in Information Technology. (1) Prerequisite: Permission of the instructor. May be taken concurrently. Independent study of a problem or application domain in applications of information technology culminating in a written case study. The course is designed to focus the new certificate student on current applications and best practices in information technology within their area of experience or interest. *(Fall, Spring)*

ITSC 6342. Information Technology Project Management. (3) Prerequisites: HADM 6152 or MBAD 6121 or MPAD 6160. A course designed to familiarize the student with the problems and problems and associate with managing information technology projects involving, particularly, integration of systems, development of client-specific solutions, and project justification. The course will move beyond the classic techniques of project management and integrate communication software/systems, multi-site, multi-client facilities projects, cultural issues involved with managing interdisciplinary teams, and the effect of rapid technological obsolescence on project justification, funding and continuance. *(Spring)*

ITSC 6352. Information Technology and Electronic Commerce. (3) Prerequisites: Permission of the instructor. A study of the evolving information technologies facilitating electronic commerce and the business practices and strategies used to compete in the new wired global marketplace. Critical issues relating to establishing and maintaining a competitively successful online presence are explored. *(Spring)*

ITSC 6362. Information Technology: Ethics, Policy, and Security. (3) Prerequisite: HADM 6152 or MBAD 6121 or MPAD 6160. With the growing pervasiveness of information technology, issues pertaining to information policy, information ethics, and data security are demanding the attention of scholars and practitioners alike. The course will examine the policy, ethical and security issues surrounding the operational, social and economic changes resulting from the shift to the information age. *(Fall)*

INFORMATION TECHNOLOGY

Doctor of Philosophy

Program of Study

The Ph.D. in Information Technology program is interdisciplinary in nature and offers opportunities for

students to develop advanced competencies in a number of IT related fields. To accommodate the interdisciplinary nature of the program, students, in cooperation with faculty advisors, design flexible programs of study tailored to address individual career goals.

Students who aspire to academically oriented research can benefit from a strong research faculty of international stature and exposure to practical applications of their specialties. Others seeking employment in industry, commerce, or government are afforded the opportunity to participate in high-quality applied research endeavors. The program is also well suited for those interested in pursuing a teaching career. Students have the opportunity to familiarize themselves with recent advances in educational technology and are able to design a broad-based program of study

Additional Admission Requirements

Admission is competitive. Preference is given to applicants with strong credentials and appropriate undergraduate and/or professional preparation.

Specific admission requirements for the program include:

1) A baccalaureate degree in a related field.
2) Excellent GRE or GMAT scores.
3) Working knowledge of two high level programming languages at the level achieved by a one semester college course in each language.
4) Evidence of skills at the level of a college course in at least 3 of the following areas:
   - Statistics
   - Differential and Integral Calculus
   - Discrete Math
   - Linear Algebra

Applicants whose native language is not English must score at least 550 in the Test of English as a Foreign Language (TOEFL). In addition, they will be required to take an English Proficiency Examination prior to the beginning of the first semester of study. Students who do not pass this examination must enroll and successfully complete ENGL 1100 (English as a Foreign Language) with a grade of B or higher.

Only complete applications will be considered for acceptance to the program. The applicant must clearly state how each requirement is satisfied and include all supporting documentation.

Highly qualified individuals who may not meet all the required prerequisites may be admitted with a clear agreement to complete all prerequisites.

Further documentation that will support the application may include: evidence of scholarly and creative activity, including publication list; awards; results in national or international contests related to information technology, and the like.

Degree Requirements

To earn the Ph.D., students must complete at least 72 post baccalaureate credit hours. This will include 54 or more hours of course work beyond the bachelor's degree and 18 hours of dissertation research credit. A limited amount of transfer credit is allowed (see below for details).

Students are expected to excel in all course work. Graduation requirements mandate that students must achieve a minimum grade point average of 3.0. An accumulation of more than two C grades or a grade of U in any course will result in termination of the student's enrollment in the Ph.D. program. In both cases, enrollment will be terminated and the student cannot take any further graduate course work without being readmitted to the program. Readmission to the program requires approval of the Dean of the Graduate School upon the recommendation of the Doctoral Committee for the Information Technology Doctoral Program (henceforth Doctoral Committee). The dissertation is graded on a pass/fail basis and, therefore, will not be included in the overall assessment of cumulative average.

Requirements for Admission to Ph.D. Candidacy

1) Appointment of an Advisory Committee of at least four faculty members. The Advisory Committee must be approved by the Doctoral Committee. In addition, the Graduate School will appoint a graduate faculty representative to the Advisory Committee.
2) Completion of the comprehensive examinations (see below)
3) Successful defense of the dissertation proposal.

Assistantships

Teaching and research assistantships are available on a competitive basis.

Transfer Credit

In accordance with rules of the UNC Charlotte Graduate School, students are allowed to transfer up to 30 semester hours of graduate credit earned at UNC Charlotte or other recognized graduate programs. In cases of applicants with records of exceptionally high quality, the Doctoral Committee, at its discretion, may request that the Graduate School approve transfer credit beyond the limit set by the Graduate School.

To receive transfer credit, students must file a written request and submit all necessary documentation to the Ph.D. coordinator. The Ph.D. coordinator will evaluate the application and make appropriate recommendations to the Doctoral Committee for final approval. In general, courses taken in Computer Science, and many courses taken in a Business School are regarded as appropriate. It should be emphasized that the student's Ph.D. Advisory Committee will make the ultimate decision as to what

courses the student must take to complete his/her study at UNC Charlotte.

Comprehensive Examinations

IT Core Examination

All students must complete the core of IT examination based on the Information Technology Core which includes:

CSCI 8160	Database Systems Design and Management (3)
INFO 8200	Information Systems Development (3)

One of the following:

CSCI 8150	Intelligent (3)
CSCI 8166	Networking or Business Telecommunications (3)
INFO 8100	Research Methodologies (3)

The core examination is offered Fall and Spring semesters. Students must notify the Ph.D. coordinator, in writing, of their intent to sit for the exams within the first two weeks of the semester in which they wish to sit for the exam.

The core examination may not be taken any more than twice and core exams will not be administered anymore than once a semester. A second failure will result in termination of enrollment

Area examination

Each student is also expected to pass an area examination in addition to the core of IT examination. The area examination will be based on a body of courses, consisting of at least two related courses, chosen by the student and approved by both the student's Advisory Committee and the Doctoral Committee.

Students must notify the Ph.D. coordinator in writing within the first two weeks of the semester in which s/he wishes to take the exam. The notification must include the proposed set of courses the exam is to cover, and the faculty who have consented to draft the exam.

The second written examination may be taken at most twice, at different semesters. The second failure will result in termination of the student's enrollment in the Ph.D. program.

Committees

Doctoral Committee: Elected by the faculty of the Ph.D. IT program. This committee is responsible for:

1) Evaluating applicants for admission to the program.
2) Approving the student's advisory committee and dissertation topic.
3) Assuring the written comprehensive exams are given appropriately.
4) Recommending course additions and alternations to the appropriate department's faculty.
5) Recommending to the doctoral faculty changes in admission requirements, and degree requirements.
6) Recommending to the doctoral faculty changes in the governance of the Ph.D. program.
7) Recommending to the Executive Committee candidates for teaching assistantships and tuition waivers.
8) Approving faculty for participation in the degree program.
9) Providing input to budget allocations on matters that impact the Ph.D. program

Executive Committee, chaired by the coordinator of the Ph.D. program will be responsible for the administration of the Ph.D. program.

Ph.D. Candidacy

Each student must present and defend a Ph.D. dissertation proposal. The exam will be conducted by the student's Advisory Committee and will be open to the Ph.D. IT faculty and students. At the discretion of Advisory Committee, the defense may include questions that cover student's program of study and background knowledge in the area of the proposal.

A doctoral student advances to Ph.D. candidacy after the dissertation proposal has been successfully defended.

The second failed defense of a dissertation proposal will result in termination of the student's enrollment in the Ph.D. program.

Dissertation

The student must complete a research program approved by the student's dissertation advisor that yields a high quality, original and substantial piece of research. The Ph.D. dissertation describes this research result. The dissertation defense, where the dissertation is presented and defended, is open to the public. A written copy of the dissertation must be made available to the Ph.D. IT Doctoral Committee, to each member of the Advisory Committee, and to the UNC Charlotte Library at least three weeks prior to the public defense. The date of the public defense must be publicly announced at least three weeks prior to the defense. The student must successfully present the dissertation and defend it in the manner accepted by the Advisory Committee. The dissertation will be graded as pass/fail by the Advisory Committee and the dissertation must be approved by the Dean of the Graduate School.

The failed defense of a dissertation will result in termination of the student's enrollment in the Ph.D. program.

Residency Requirements

The student must satisfy the residency requirement of one continuous full-time year (i.e., two consecutive semesters with the student being enrolled for at least nine graduate credit hours in each semester) after being admitted to the Ph.D. degree program.

Tuition Waivers

Out of state tuition waivers are available, on a competitive basis, to full time students with financial assistantships from UNC Charlotte.

Research Opportunities/Experiences

Students will be afforded the opportunity to participate in many of the on-going research projects occurring at UNC Charlotte.

COURSES IN INFORMATION TECHNOLOGY - DOCTORAL

(Computer Science, Information Technology, and Management Information Systems)

Students can also select graduate level courses in other disciplines e.g., Computer Science, and College of Business.

CSCI 8010. Topics in Computer Science. (3) Prerequisite: consent of the department. Topics in computer science selected to supplement the regular course offerings. May be repeated for credit as topics vary. *(On demand)*

CSCI 8050 Advanced Topics in Artificial Intelligence. (3) Prerequisite: consent of the department. Topics in intelligent systems selected to supplement the regular course offerings. May be repeated for credit as topics vary. *(Spring)(Alternate years) (Evenings)*

CSCI 8080 Topics in Computer Engineering. (3) Prerequisite: consent of the department Topics in computer engineering selected to supplement the regular course offerings. May be repeated for credit as topics vary. *(On demand)*

CSCI 8102 Survey of Programming Languages. (3) Prerequisite: consent of the department. Study of the concepts underlying various computer languages and comparing and evaluating various language features. History and development of various languages, such as FORTRAN, ALGOL, PASCAL, MODULA-2, C, C++, Ada, Lisp, Smalltalk, Prolog.; evaluation and comparison of various algorithms and language suitability. Selection of languages for problems/environments. Overview of various languages. *(Fall, Spring) (Evenings)*

CSCI 8107. Formal Languages and Automata. (3) Prerequisites: one semester of discrete structures or consent of the department. Detailed study of abstract models for the syntax of programming languages and information processing devices. Languages and their representation; grammars; finite automata and regular sets; context-free grammars and pushdown automata; Chomsky Hierarchy; closure properties of families of languages; syntax analysis. *(On demand)*

CSCI 8110. Advanced Topics in Programming Languages and Compilers. (3) Prerequisite: consent of the department Topics in computer engineering selected to supplement the regular course offerings. May be repeated for credit as topics vary. *(On demand)*

CSCI 8111. Evolutionary Computation. (3) Prerequisite: CSCI 8114 or consent of the department. General introduction to optimization problems. Optimization techniques: hill climbing, simulated annealing, evolution strategies, genetic algorithms. Evolution programming techniques. *(Spring) (Alternate years)(Evenings)*

CSCI 8112 Software Systems Design and Implementation (3) Prerequisite: consent of the department. Introduction to the techniques involved in the planning and implementation of large software systems. Emphasis on human interface aspects of systems. Planning software projects; software design process; top-down design; modular and structured design; management of software projects; testing of software; software documentation; choosing a language for software system. *(Fall, Spring) (Evenings)*

CSCI 8114. Algorithms and Data Structures. (3) Prerequisite: full graduate standing. Introduction to techniques and structures used and useful in design of sophisticated software systems. Records; arrays; linked lists; queues; stacks; trees; graphs; storage management and garbage collection; recursive algorithms; searching and sorting; graph algorithms; time and space complexity. *(Fall, Spring) (Evenings)*

CSCI 8115. Advanced Topics in Algorithms and Data Structures. (3) Prerequisite: CSCI 8114. Continuation and extension of CSCI 6114. String matching; seminumerical algorithms; probabilistic algorithms; parallel algorithms; NP-completeness; computationally hard problems; approximation algorithms. *(On demand)*

CSCI 8130 Computer Graphics (3) Prerequisites: CSCI 5130 or equivalent, full graduate standing or consent of department. Implicit and parametric representation; cubic surfaces; advanced reflection models; global illumination models - ray tracing, radiosity; shadow algorithms, texture mapping; volumetric modeling and rendering techniques; animation; advanced modeling techniques; particle systems, fractals. *(On demand)*

CSCI 8132. Computer Modeling and Simulation. (3) Prerequisites: CSCI 5131 and consent of department. Introduction to modeling of complex systems. Emphasis on modeling of computer systems and configurations. *(On demand)*

CSCI 8134. Digital Image Processing. (3) Prerequisite: CSCI 8114 or consent of the department. Cross-listed as ECGR 6118. Image perception; image types/applications; image restoration and enhancement; edge/boundary detection; image transformation; image

segmentation; statistical and syntactical pattern recognition; image information measures and compression. *(On demand)*

CSCI 8140. Data Visualization. (3) Prerequisite: Full graduate standing or consent of department. Emphasis on the methodology and application of data visualization to scientific and engineering data; data types and models; visualization methods; volume visualization; scalar, vector and tensor fields; multi-variate visualization; visualization systems and model; visualization applications; visualization software and hardware; research issues and future trends. *(Fall)(Alternate years)(Evenings)*

CSCI 8141. Computer Organization and Architecture. (3) Prerequisite: CSCI 3182 or equivalent. Fundamentals of computer design; instruction set design, basic processor implementation techniques; pipelining; memory hierarchy; Input/Output. Cost/performance and hardware/software trade-offs. *(Fall, Spring) (Evenings)*

CSCI 8144. Operating Systems Design. (3) Prerequisite: CSCI 8114 or consent of department. Introduction to features of a large-scale operating system with emphasis on resource-sharing environments. Computer system organization; resource management; multiprogramming; multi-processing; file systems; virtual machine concepts; protection and efficiency. *(Fall)(Alternate years) (Evenings)*

CSCI 8145. Parallel Computing. (3) Prerequisites: CSCI 1215 and 3182 or consent of department. Types of parallel computers, programming techniques for multiprocessor and multicomputer systems, parallel strategies, algorithms, and languages. *(Spring) (Alternate years) (Evenings)*

CSCI 8148. Advanced Object-Oriented Systems. (3) Prerequisites: CSCI 8114 and 8102, or equivalent courses. This course focuses on issues related to the design, implementation, integration, and management of large object-oriented systems. Topics include: object models, object modeling, frameworks, persistent and distributed objects, and object-oriented databases. *(Fall)(Alternate Years)(Evenings)*

CSCI 8150. Intelligent Systems. (3) Prerequisites: CSCI 2215 or consent of department. To introduce core ideas in AI. Heuristic versus algorithmic methods; problem solving; game playing and decision making; automatic theorem proving; pattern recognition; adaptive learning; projects to illustrate theoretical concepts. *(Fall)(Alternate years)(Evenings)*

CSCI 8151. Intelligent Robotics. (3) Prerequisites: CSCI 1215 and MATH 2164, or consent of the department. General introduction to spatial descriptions and transformations, and manipulator position and motion. More study on robot planning, programming, sensing, vision, and CAD/CAM. *(On demand)*

CSCI 8152. Computer Vision. (3) Prerequisites: CSCI 1215 or MATH 2164, or consent of the department. General introduction to Computer Vision and its application. Topics include low level vision, 2D and 3D segmentation, 2D description, 2D recognition, 3D description and model-based recognition, and interpretation. *(On demand)*

CSCI 8153. Neural Networks. (3) Prerequisites: CSCI 6114. Topics include: Basic notions and models of artificial neural nets; single layer neural classifiers; multilayer one-way neural nets; single layer feedback networks; neural models of associative memory; self organizing neural nets; translation between neural networks and knowledge bases; applications of neural networks *(On demand)*

CSCI 8154. Heuristic Search. (3) Prerequisite: CSCI 8150. Heuristics and problem representation; heuristic-search procedures; formal properties and performance analysis of heuristic methods; game-searching strategies and heuristic programming; search with probabilities; knowledge-guided search. *(Spring)(Alternate years)(Evenings)*

CSCI 8155. Knowledge-Based Systems. (3) Prerequisite: CSCI 8150. Knowledge representation; automatic deduction; techniques for handling uncertainty and inexact knowledge; principles of rule-based systems and frame-based systems. Selected study of actual knowledge-based systems and knowledge engineering tools. A course project of building a knowledge-based system. *(Fall)(Alternate years)(Evenings)*

CSCI 8156. Machine Learning. (3) Prerequisite: CSCI 8150. Machine learning methods and techniques including: acquisition of declarative knowledge; organization of knowledge into new, more effective representations; development of new skills through instruction and practice; and discovery of new facts and theories through observation and experimentation. *(On demand)*

CSCI 8157. Computer-Aided Instruction. (3) Prerequisite: consent of the department. History of CAI; study of current CAI systems; development of man-machine dialogue; programming tools for CAI; information structures for computer-oriented learning. Advantages/disadvantages/ costs of CAI. *(On demand)*

CSCI 8158. Natural Language Processing. (3) Prerequisite: CSCI 8150. Principles, methodologies, and programming methods of natural language processing including foundations of natural language understanding, namely: lexical, syntactic, and semantic analysis, discourse integration, and pragmatic and morphological analysis. *(On demand)*

CSCI 8160. Database Systems, Design and Management. (3) Prerequisite: CSCI 8114 or consent of the department. Introduction to principles of database

design, and survey of alternative database organizations and structures. Logical database organization; schemas; subschemas; data description languages; hierarchical, network, and relational databases; database management systems; normal forms. *(Fall, Spring on demand)(Evenings)*

CSCI 8161. Advanced Topics in Database Systems, Design and Management. (3) Prerequisite: CSCI 8160. Continuation of CSCI 8160. Topics include addressing techniques; physical structures; searching; compaction techniques; storage hierarchies; multiple-key retrieval; efficiency and security considerations. *(Spring)(Alternate years)(Evenings)*

CSCI 8162. Knowledge Discovery in Databases. (3) Prerequisite: CSCI 8160, full graduate standing, or consent of the department. The entire knowledge discovery process is covered in this course. Topics include: setting up a problem, data preprocessing and warehousing, data mining in search for knowledge, knowledge evaluation, visualization and application in decision making. A broad range of systems, such as OLAP, LERS, DatalogicR+, C4.5, AQ15, Forty-Niner, CN2, QRAS, and discretization algorithms are covered. *(Fall)(Alternate years)(Evenings)*

CSCI 8163. Data Warehousing. (3) Prerequisite: CSCI 8160 or equivalent. Topics include: use of data in discovery of knowledge and decision making; the limitations of relational databases and SQL queries; the warehouse data models: multidimensional, star, snowflake; architecture of data warehouse and the process of warehouse construction; data consolidation from various sources; optimization; techniques for data transformation and knowledge extraction; relations with enterprise modeling. *(Fall)(Alternate years)(Evenings)*

CSCI 8164. Design and Implementation of Online Management Information Systems. (3) Prerequisites: CSCI 8114 or consent of the department. The fundamental concepts and philosophy of planning and implementing an on-line computer system. Characteristics of on-line systems; hardware requirements; modeling of on-line systems; performance measurement; language choice for on-line systems; organization techniques, security requirements; resource allocation. *(On demand)*

CSCI 8165. Coding and Information Theory. (3) Prerequisite: knowledge of probability theory. Information theory; coding theory; Shannon's theorem; Markov process; channel capacity; data transmission codes; error correcting codes; data compression; data encryption. *(On demand)*

CSCI 8166. Computer Communications and Networks. (3) Prerequisite: CSCI 8114 or consent of the department. Introduction to the concepts of computer networks; their operating systems; and communication between nodes. Types of networks; communications and protocols; routing; message switching; optimization; distributed processing; coding and compaction. *(Spring)(Evenings)*

CSCI 8167. Network and Information Security. (3) Prerequisite: CSCI 8166 or equivalent knowledge of object-oriented programming and the Java programming language are assumed. This course examines issues related to network and information security. Topics include security concepts, security attacks and risks, security architectures, security policy management, security mechanisms, cryptography algorithms, security standards, security system interoperation and case studies of the current major security systems. *(On demand)*

CSCI 8170. Logic for Artificial Intelligence. (3) Prerequisite: CSCI 8150 or consent of the department. Introduction to basic concepts of logic for artificial intelligence, including declarative knowledge, inference, resolution, nonmonotonic reasoning, induction, reasoning with uncertain beliefs, distributed information systems, intelligent information systems, planning and intelligent-agent architecture. *(On demand)*

CSCI 8171. Logic Programming. (3) Prerequisite: CSCI 2215 or consent of the department. Prolog programming language; programming techniques in Prolog; foundations of logic programming including computability of Horn clause logic, completeness of resolution principle, complexity of unification algorithms, and verification of logic programs; principles of implementing logic programming systems; selected topics from applications of logic programming to expert systems, intelligent database systems, and/or natural language processing. *(On demand)*

CSCI 8175. Computability and Complexity. (3) Prerequisite: consent of the department. Study of computability, unsolvability, computational complexity. Concept of effective computability; recursive functions; mathematical models of computation; universal Turing machines; unsolvable problems; time and space complexity of computations; NP-completeness problems; subrecursive hierarchies. *(On demand)*

CSCI 8181. Switching and Automata Theory. (3) Prerequisite: consent of the department. Topics include sets, relations, lattices, Boolean algebras; functional decomposition and symmetric functions; threshold logic; multiple-valued logic; fault detection and fault tolerant design; finite state machines, incompletely specified machines, minimization; state identification and fault detection experiments; finite state recognizers. *(On demand)*

CSCI 8182. Advanced Computer Architecture. (3) Prerequisite: CSCI 8141. Survey of existing and proposed architectures; pipelined, dataflow, restructurable, and supercomputer architectures. Multicomputer and multi-processor architectures. Impact of VLSI on architecture. *(Spring)(Alternate years)(Evenings)*

CSCI 8183. Computer Arithmetic. (3) Prerequisite: permission of the department. Principles, architecture, and design of fast two operand adders; multioperand adders, standard multipliers, and dividers. Cellular array multipliers and dividers. Floating point processes, BCD, and excess three adders, multipliers, and dividers. *(On demand)*

CSCI 8184. Fault Tolerant Digital Systems. (3) Prerequisite: CSCI 8141. Design and analysis of fault tolerant digital systems including design techniques, qualitative and quantitative methods of evaluation, and available fault tolerant digital systems. *(Fall)(Alternate years)(Evenings)*

CSCI 8186. Microelectronics System Design and Simulation. (3) Prerequisite: CSCI 8141. Project oriented course on techniques and methodology in design and development of microelectronics systems including system specifications, hardware design of specific building blocks, simulation and iterative refinement of system boards, interface structure and data communication, interconnection architecture, printed circuit boards, and techniques for testing and debugging. *(Fall) (Alternate years)(Evenings)*

ITSC 8342. Information Technology Project Management. Prerequisites: Graduate standing or permission of the instructor. A course designed to familiarize the student with the problems associated with managing information technology projects involving, particularly, integration of systems, development of client-specific solutions, and project justification. The course will move beyond the classic techniques of project management and integrate communication software/systems, multi-site, multi-client facilities projects, cultural issues involved with managing interdisciplinary teams, and the effect of rapid technological obsolescence on project justification, funding and continuance. *(Spring)*

ITSC 8352. Information Technology for Electronic Commerce (3) Prerequisites: Permission of the instructor. A study of the evolving information technologies facilitating electronic commerce and the business practices and strategies used to compete in the new wired global marketplace. Critical issues relating to establishing and maintaining a competitively successful online presence are explored. *(Spring)*

ITSC 8362. Information Technology: Ethics, Policy, and Security. Prerequisite: HADM 6152 or MBAD 6121 or MPAD 6120. Management of Information technology involves understanding the broader issues of ethics, Policy and Security. The growth in Internet usage and E-commerce require IT professionals to consider issues pertaining to data protection, regulation, and appropriate use and dissemination of information. The course is designed to be team-taught by professionals in the field. *(Fall)*

ITSC 8880. Individual study. (3) Prerequisites: Consent of department. With the direction of a faculty member, students plan and implement appropriate objectives and learning activities to develop specific areas of expertise through research, reading, and individual projects. May be repeated for credit. *(On demand)*

ITSC 8991. Doctoral dissertation research. (0-9) Individual investigation culminating in the preparation and presentation of a doctoral dissertation. *(On demand)*

INFO 8100. Information Systems Research Methodologies. (3) Prerequisites: Graduate standing or permission of the instructor. A study of statistical and research methods used in information systems research. *(Yearly)*

INFO 8200. Business Information Systems: Analysis, Design, and Management. (3) Prerequisites: MBAD 6121 or consent of the department. This course integrates real-world concerns in developing business information systems with research issues. Major topics include the organizational value of information systems, selecting and justifying information systems projects, alternative systems development methodologies, Object-Oriented analysis and design and UML, CORBA and middleware, Component-based development, Outsourcing, and IS project management.

LIBERAL STUDIES

Department of Liberal Studies

103 Macy Building
(704) 547-4312

Coordinator

Dr. Dale Grote

Degree

M.A.

Program of Study

The Master of Arts degree program in Liberal Studies is designed primarily for adults seeking to enhance their general education in the liberal arts at the graduate level. It provides a flexible, multidisciplinary framework to accommodate the varied undergraduate backgrounds and personal interests that students bring to the program. The curriculum draws upon the full range of the humanities, social sciences, and natural sciences. The emphasis is on liberal arts education rather than on specialized study or professional training.

For recent recipients of the baccalaureate degree, the Liberal Studies program may provide the insight needed to make an informed career choice, or it may enhance opportunities in a career already launched. For returning

students, graduate liberal studies may renew ties with university life or lead to a change of career. For persons with significant work experience, the program offers a chance to integrate the life of the mind with that of the workplace. Just as students come to the Liberal Studies program from a variety of fields, so they pursue a variety of careers after graduation. The most widely represented are in business, education, government, law, and social services.

Although the Liberal Studies program is not exclusively an evening program, the majority of courses are offered at times convenient for working adults. It is possible to earn the degree in a timely fashion through evening courses only.

Additional Admission Requirements

In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Liberal Studies:

1) A GPA of at least 2.75 on academic work beyond high school and 3.0 for courses prerequisite to the area of proposed graduate study.
2) Satisfactory scores on the Miller Analogies Test or the Verbal and Analytical portions of the Graduate Record Examination.
3) A two-page essay describing the applicant's objectives in undertaking graduate work in Liberal Studies.
4) A resume of employment history or volunteer experience (for applicants who have been out of school for at least five years or whose baccalaureate degree was delayed).
5) Acceptance into the program is contingent on an interview with members of the Liberal Studies Faculty Advisory Committee.

Degree Requirements

The master's program in Liberal Studies requires a minimum of 30 semester hours of graduate work with grades of A or B, including at least 15 semester hours in courses open only to graduate students. A course in which a student receives a grade of 'C' is not allowable as part of the 30 required hours.

The program begins with two core courses that give students some common grounding in the issues of liberal arts education. Each student then chooses a program emphasis by completing at least four courses that focus on a common theme. Degree requirements also include a Liberal Studies elective course and two elective courses that can be taken in any department in the College of Arts and Sciences. The program concludes with a seminar, a master's essay or project, and a comprehensive examination. The requirements are outlined below:

Core Courses

LBST 6101	The Liberal Arts Tradition (3)
LBST 6102	Ideas Across the Disciplines (3)

Program Emphasis

Four related courses focusing on a theme developed by the student and faculty advisor 12 hours

Liberal Studies Elective 3 hours

General Electives 6 hours

Concluding Seminar

LBST 6600 Liberal Studies Seminar (3)

No more than 6 hours of independent study may be applied to the degree. Students requesting independent study must have successfully completed at least 12 semester hours in the program, including LBST 6101 and 6102. A form for such requests is available in the Coordinator's office and must be completed and the study approved in advance of registration.

Comprehensive Examination

Each candidate concludes the program with a comprehensive examination taken during the final semester of course work. The examination is a part of the concluding seminar and is individually designed, based on each student's program. It allows the student to integrate material from a variety of disciplines and to demonstrate understanding of the scope of Liberal Studies.

Assistantships

A limited number of graduate assistantships are available each year. In order to be fully competitive, applications must be received by March 15. Application forms are available through the Graduate School.

Prizes

A Spring Prize of $250 is awarded annually for an outstanding paper or project completed for a LBST course. Only students admitted to the Liberal Studies program by the submission deadline for the prize are eligible.

Courses In Liberal Studies

LBST 6000. Topics in Liberal Studies. (3) Selected topics approached from interdisciplinary perspectives in the liberal arts. May be repeated for credit as topics change. Examples include interrelated courses forming program emphases on Language and Culture and on Religious Ideas in Physical Forms. (*Fall, Spring*)

LBST 6101. The Liberal Arts Tradition. (3) The concept of a liberal education and its relationship to human understanding as reflected in representative historical traditions, literature, art, and intellectual works. Examination of selected classics of the Western tradition and critiques through the use of works from other traditions and perspectives. (*Fall, Spring*)

LBST 6102. Ideas Across the Disciplines. (3) Enduring ideas and their impact on history, society and culture. Each semester a single idea is examined through a variety of writings spanning the liberal arts disciplines. Examples include the idea of nature, the idea of human nature, the idea of the democracy and the idea of citizen. *(Fall, Spring)*

LBST 6600. Liberal Studies Seminar. (3) An integration of the course work previously taken by each of the seminar members and the completion of a final essay or project. *(Yearly)*

MATHEMATICS

Department of Mathematics
376 Fretwell Building
(704) 547-2580
http://www.math.uncc.edu/grad/

Mathematics Degrees
M.A., M.S., Ph.D.

Coordinator for Mathematics
Dr. Joel D. Avrin

Mathematics Education Degree
M.A.

Coordinator for Mathematics Education
Dr. Victor Cifarelli
http://www.math.uncc.edu/grad/mamathed.htm

Graduate Faculty
Robert Anderson
Joel Avrin
Charles Burnap
Wei Cai
Zongwu Cai
Victor V. Cifarelli
Xingde Dai
Yuanan Diao
Mary Kim Harris
Evan G. Houston
Phillip Johnson
Janusz Kawczak
Mohammad-Ali Kazemi
Michael V. Klibanov
Alan L. Lambert
Thomas G. Lucas
Thomas R. Lucas
Stanislav Molchanov
Hae-Soo Oh
Alex S. Papadopoulos
Joseph E. Quinn
Harold Reiter
Franz Rothe
David C. Royster
Adalira Saenz-Ludlow
Nancy Schopes
Douglas S. Shafer
Isaac M. Sonin
Nickolas M. Stavrakas
Yanqing Sun
Rajeshwari Sundaram
Ram C. Tiwari
Boris R. Vainberg
Barnet Weinstock
Volker Wihstutz
Alexander Yushkevich
Zhi Yi Zhang
You Lan Zhu

MATHEMATICS
Master of Science Degree

The Master of Science Degree in Mathematics is organized into three tracks: the **Track in General Mathematics, the Track in Applied Mathematics, and the Track in Applied Statistics.** The Track in General Mathematics is a robust but flexible program that allows a student to develop a broad background in Mathematics ranging over a variety of courses chosen from both pure and applied areas, or to tailor a program toward a particular focus that may not be as closely covered by our other degree tracks, e.g. one that is interdisciplinary in nature. The Track in Applied Mathematics develops analytical and computational skills focused toward applications of mathematics in the physical sciences as encountered in industry, government, and academia. The Track in Applied Statistics provides theoretical understanding of, and training in, statistical methods applicable to particular areas of business, industry, government, and academia.

Track in General Mathematics

The Master of Science degree Track in General Mathematics is designed both to provide advanced skills and knowledge for persons seeking either positions in industry or in government, or teaching positions at the community college level, and to provide professional development to persons currently in such positions. Graduates of the program also are prepared to enter directly into at least the second year of a Ph.D. program in mathematics, applied mathematics or statistics, depending on the particular course of study.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following are required for the Track in General Mathematics:

1) Applicants must present evidence of the satisfactory completion of at least 27 semester hours of mathematics approved by the department Graduate Committee.

2) A satisfactory score is required on at least the Quantitative portion of the Graduate Record Examination.
3) It is recommended that the student have a basic knowledge of at least two of the areas of algebra, real analysis and topology.

Track Requirements

The Master of Science degree track in Mathematics requires successful completion of at least 30 semester hours of graduate work approved by the department Graduate Committee including: MATH 5143 and 5144 or their equivalents, at least one course each from two of the groups I, II, III, and V, and at least 15 hours in 7000-level courses. No credit shall be given for 6000-level math courses. With the approval of the department Graduate Committee, one 3-hour, non-thesis 6000-level course in computer science of a theoretical nature may be applied toward the 15 hours. Candidates for the degree track must demonstrate, to the satisfaction of the department Graduate Committee, competence on general knowledge in at least three of five groupings of courses listed below. This may be accomplished by (a) successful performance on a written comprehensive examination or (b) successful completion of courses in these areas.

Group I Applied Mathematics

OPRS 5111	Linear Programming (3)
OPRS 5112	Non-Linear Programming (3)
OPRS 5113	Game Theory (3)
OPRS 5114	Dynamic Programming (3)
MATH 5165	Numerical Linear Algebra (3)
MATH 5172	The Finite Element Method (3)
MATH 5173	Ordinary Differential Equations (3)
MATH 5174	Partial Differential Equations (3)
MATH 5176	Numerical Methods for Partial Differential Equations (3)
MATH 7172	Partial Differential Equations (3)
MATH 7176	Advanced Numerical Analysis (3)
MATH 7177	Applied Optimal Control (3)
MATH 7178	Comp. Methods for Fluid Dynamics (3)
MATH 7273	Advanced Finite Element Analysis (3)

Group II Probability-Statistics

STAT 5123	Applied Statistics I (3)
STAT 5124	Applied Statistics II (3)
STAT 5126	Theory of Statistics I (3)
STAT 5127	Theory of Statistics II (3)
STAT 7027	Topics in Statistics (3)
STAT 7122	Advanced Statistics I (3)
STAT 7123	Advanced Statistics II (3)
STAT 7127	Linear Statistical Models (3)
STAT 7133	Multivariate Analysis (3)
MATH 5128	Applied Probability I (3)
MATH 5129	Applied Probability II (3)
MATH 7120	Probability Theory I (3)
MATH 7121	Probability Theory II (3)
MATH 7125	Stochastic Processes (3)

Group III Algebra-Topology

MATH 5163	Modern Algebra (3)
MATH 5164	Abstract Linear Algebra (3)
MATH 5181	Introduction to Topology (3)
MATH 7163	Modern Algebra I (3)

Group IV Analysis

MATH 5143	Analysis I (3)
MATH 5144	Analysis II (3)
MATH 7141	Complex Analysis I (3)
MATH 7143	Real Analysis I (3)
MATH 7144	Real Analysis II (3)

Group V Computer Science

All 5000- and 6000-level Computer Science courses.

Thesis

Completion of a thesis is optional. With the approval of the department Graduate Committee, a candidate may receive up to six of the 15 hours required at the 7000 level for the writing of a master's thesis on an approved topic. This thesis may be original work, work of an expository nature, or the mathematical formulation and solution of a particular industrial or business problem suggested by the career interests of the student. A candidate may receive no more than six of the hours required at the 7000 level for course and thesis work in computer science. If the thesis option is elected, the candidate will be required to defend his/her thesis in an oral examination.

Comprehensive Examination

A candidate must perform satisfactorily on an oral comprehensive examination over his/her program of study.

Track in Applied Mathematics

The Master of Science degree Track in Applied Mathematics is designed to develop critical thinking and intuition, and to provide advanced work in the techniques of mathematical analysis and their application to the problems of industry and technology. Skills are developed to deal with problems encountered in industry, business, and governmental work; to hold leadership positions in industry or government work; to teach Applied Mathematics at the undergraduate or community college level; and to study Applied Mathematics leading to the Ph.D. degree.

Track Requirements

A candidate for the Master of Science degree Track in Applied Mathematics must complete at least 30 semester hours of graduate work approved by the department Graduate Committee to include:

Core Requirements (21 semester hours)

1) MATH 5143 Analysis I (3)
   MATH 5144 Analysis II (3)

MATH 5165 Numerical Linear Algebra (3)

2) One elective in Numerical Analysis selected from:
   - MATH 5172 The Finite Element Method (3)
   - MATH 5176 Numerical Methods for Partial Differential Equations (3)
3) One elective in Advanced Analysis selected from:
   - MATH 7141 Complex Analysis I (3)
   - MATH 7143 Real Analysis I (3)
   - MATH 7144 Real Analysis II (3)
4) Two electives in Advanced Applied Mathematics selected from:
   - MATH 7172 Partial Differential Equations (3)
   - MATH 7176 Advanced Numerical Analysis (3)
   - MATH 7177 Applied Optimal Control (3)
   - MATH 7178 Computational Methods for Fluid Dynamics (3)
   - MATH 7273 Adv. Finite Element Analysis. (3)

Electives (6 semester hours)

1) One advanced elective from:
   - MATH 7141 Complex Analysis I (3)
   - MATH 7143 Real Analysis I (3)
   - MATH 7144 Real Analysis II (3)
   - MATH 7172 Partial Differential Equations (3)
   - MATH 7176 Advanced Numerical Analysis (3)
   - MATH 7177 Applied Optimal Control (3)
   - MATH 7178 Computational Methods for Fluid Dynamics (3)
   - MATH 7273 Adv. Finite Element Analysis (3)
   - MATH 7893 Thesis (0-3)
2) One elective in Mathematics or a suitable area of application to be selected with the approval of the student's adviser. Suggested electives include:
   - OPRS 5113 Game Theory (3)
   - STAT 5123 Applied Statistics I (3)
   - CSCI 5131 Simulation (3)
   - MEGR 4111 Heat Transfer (3)
   - MEGR 4112 Intermediate Fluid Mechanics (3)
   - MEGR 6113 Adv. Conductive Heat Transfer (3)
   - MEGR 6141 Theory of Elasticity II (3)

Research Seminar (3 hours)

All candidates for the degree track must complete three hours of MATH 7691 (Research Seminar) in which they carry out an independent project under the supervision of a member of the graduate faculty. The project could involve a specific application to a concrete problem of techniques identified in the literature or studied in other courses. All projects are subject to prior approval of the department Graduate Committee and must be successfully defended before a committee of three graduate faculty members appointed by the department Graduate Committee.

Thesis

A student may choose to expand the work begun in MATH 7691 into a master's thesis by registering for three hours of MATH 7893 to fulfill the advanced elective requirement (1) described above. This thesis option affords the student the opportunity to do professional/scholarly work demonstrating proficiency in the area of Applied Mathematics.

Comprehensive Examination

Each candidate for the degree track in Applied Mathematics must perform satisfactorily on a final comprehensive examination. This examination will be set and administered by a committee appointed by the department Graduate Committee. It may be either in written or oral form, and it will cover those areas of study and/or research deemed appropriate by the committee.

Track in Applied Statistics

The Master of Science degree Track in Applied Statistics is designed to provide advanced skills and knowledge in the planning, design, testing, and implementation of statistical methods. Skills are developed to deal with problems encountered in statistical applications in business, industry and government; to hold administrative positions requiring planning and implementation of statistical analysis; to teach statistics at the undergraduate or community college level; and to study statistics leading to the Ph.D. degree.

Additional Admission Requirements

In addition to the general requirements for admission to the Graduate School, the following are required for the Track in Applied Statistics:

1) An overall GPA of at least 3.0 on all previous college work including a GPA of at least 3.0 in courses prerequisite to the area of applied statistics.
2) Evidence of undergraduate preparation in mathematics and computer science including: 12 semester hours of calculus at the level of MATH 1241/1242/2241/2242; 3 semester hours of linear algebra at the level of MATH 2164; 3 semester hours of differential equations at the level of MATH 2171; 6 semester hours of probability and statistics at the level of MATH 3122/3123; and 3 semester hours of computer programming at the level of CSCI 1100 or 1214 and its lab.

Degree Requirements

A candidate for the Master of Science degree Track in Applied Statistics must complete a minimum of 33 semester hours of graduate work approved by the department Graduate Committee including:

Core Requirements (24 semester hours)

- STAT 5123 Applied Statistics I (3)
- STAT 5124 Applied Statistics II (3)
- STAT 5126 Theory of Statistics I (3)
- STAT 5127 Theory of Statistics II (3)
- STAT 7027 Topics in Statistics (3)
- STAT 7127 Linear Statistical Models (3)
- STAT 7133 Multivariate Analysis (3)
- MATH 7691 Research Seminar (1-3)

Electives (9 semester hours)
1) Two course selected from among:

CSCI 5131	Computer Simulation (3)
STAT 7027	Topics in Statistics (3)
MATH 5128	Applied Probability I (3)
MATH 5129	Applied Probability II (3)
MATH 5143	Analysis I (3)
MATH 5165	Numerical Linear Algebra (3)
MATH 7120	Probability Theory I (3)
MATH 7121	Probability Theory II (3)
MATH 7143	Real Analysis I (3)
MATH 7692	Research Seminar (3)
OPRS 5111	Linear Programming (3)
OPRS 5112	Non-linear Programming (3)
OPRS 5113	Game Theory (3)
OPRS 5114	Dynamic Programming (3)

2) Any MATH/STAT/OPRS course at the 7000 level.
Students who, because of their undergraduate work or other experience, can demonstrate sufficient knowledge of the material in one or more of the core courses may be exempted from taking the course or courses. Exemption from a course carries no credit towards the degree track.

Research Seminar and Thesis Option (3 semester hours)
All candidates for the Master of Science degree track in Applied Statistics are required to complete 3 hours of MATH 7691 (Research Seminar) in which they carry out an independent project under the supervision of a member of the graduate faculty. The project could involve a specific application of techniques identified in the literature or studied in other courses. All projects are subject to the prior approval of the department Graduate Committee and must be successfully defended before a committee of three graduate faculty members appointed by the department Graduate Committee.

A student may choose to expand the work begun in MATH 7691 (Research Seminar) into a Master's Thesis by registering for 3 hours of MATH 7893 (Thesis) to fulfill the elective requirement under (2) above. This thesis option affords the student the opportunity to do professional and scholarly work demonstrating proficiency in the area of applied statistics.

Comprehensive Examination
Each candidate for the Master of Science degree track in Applied Statistics must perform satisfactorily on an oral comprehensive examination over the candidate's program of study.

MATHEMATICS EDUCATION
Master of Arts Degree

Program of Study
The Master of Arts in Mathematics Education degree program is designed primarily for secondary mathematics school teachers interested in professional growth and graduate certification in mathematics teaching. Emphasis in this program is given to developing depth and breadth in mathematics teaching and learning, appropriate to the role of the secondary school teacher.

Additional Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Mathematics Education:
1) Twenty-seven hours of undergraduate coursework in Mathematics beyond the freshman level, or evidence of equivalent academic preparation.
2) Possession of a North Carolina "A" teacher's license or the equivalent from another state. An applicant may be admitted on the condition that he/she satisfies the Class "A" requirements early in his/her course of study. Work applied to the Class "A" deficiency may not be applied toward the degree.
3) Two years of full-time experience teaching mathematics in a secondary school or other acceptable teaching experience.
4) A satisfactory score is required on the Aptitude Portion of the Graduate Record Examination.

Degree Requirements
The Master of Arts in Mathematics Education degree requires successful completion of a minimum of 36 semester hours of graduate credit or the equivalent. Of these, 18 hours must be in courses numbered 6000 or above. Programs of study beyond these 36 hours may be required to remove deficiencies in undergraduate programs or to develop areas of need, interest, or desired experience.

Core Courses
Each candidate must complete:
18 hours of graduate-level Mathematics courses selected in consultation with the program Coordinator, with at least 9 hours of courses at the 6000-level. A recommended plan of study includes:

MATH 6100	Foundations of Mathematics (3)
MATH 6101	Foundations of Real Analysis (3)
MATH 6102	Calculus from an Advanced Viewpoint (3)
MATH 6106	Modern Algebra (3)
MATH 6107	Linear Algebra (3)
MATH 6118	Non-Euclidean Geometry (3)

12 hours of graduate-level courses covering mathematics education learning theory, research, and contemporary

topics in secondary mathematics teaching. These courses include:

MAED 6120	Research in Mathematics Education (3)
MAED 6122	Theoretical Foundations of Learning Mathematics (3)
MAED 6124	Issues in the Teaching of Secondary School Mathematics (3)
RSCH 6101	Educational Research Methods (3)

3) 6 hours of graduate-level professional education courses including:

MDSK 6260	Principles of Teacher Leadership (3)

An additional three hours of graduate-level Mathematics, Mathematics Education, or Education courses selected in consultation with the student's adviser.

4) A Basic Portfolio consisting of documents and artifacts that provides evidence of the student's professional growth during the program. Upon admission to the program, students will plan their portfolio in consultation with their graduate advisor.

Approval of the program of each student and provision of advice regarding progress toward the degree are the responsibility of an adviser appointed by the Department of Mathematics at the time of admission.

Comprehensive Exam

Upon successful completion of all coursework, each candidate for the degree in Mathematics Education must pass a comprehensive final exam consisting of two parts. The student must pass an oral exam on the mathematics content courses. The second part of the exam involves the student making a formal presentation demonstrating their professional growth as teachers and educational researchers. The student has the option of presenting either a research-based project or a comprehensive portfolio.

APPLIED MATHEMATICS

Doctor Of Philosophy Degree

The Ph.D. degree program in Applied Mathematics is designed to enable its students to master a significant body of mathematics, including a specialty in applied mathematics; to relate this knowledge to a coherent area of science or engineering, and to carry on fundamental research in applied mathematics at a nationally competitive level. The recipient of this degree will, according to his or her abilities and choice of sub-specialty, be able to work effectively in a research and development environment involving mathematical or statistical analysis and modeling in business, government or industry; to teach mathematics at the college or university level; or to carry on fundamental research in his or her area of specialty.

Additional Admission Requirements

In addition to the requirements of the Graduate School for admission to doctoral study, applicants must have completed at least 27 hours of courses in the mathematical sciences at the undergraduate level, as approved by the department Graduate Committee, with grades of C or better. Admission requires that the candidate be able to take Real Analysis 8143 (or its equivalent). Applicants who have not completed the equivalent of MATH 5143-5144 but whose record is otherwise satisfactory may be first admitted to one of the master's programs in the department. For prospective students who have done work in mathematics beyond the bachelor's degree, performance on that work will be considered in admissions decisions. Candidates for admission must make satisfactory scores on the general portion of the Graduate Record Examination (GRE).

Students are admitted to the program by the Graduate School, based on the recommendation of the department Graduate Committee or its designate, the Graduate Program Coordinator. Recommendations are based on the Committees judgement of the candidate's ability to complete the program, as supported by the application materials. The department may waive certain requirements if it judges the candidate to be nonetheless capable of completing the program. If there are more candidates than can be accommodated, candidates are admitted in order of perceived mathematical ability, promise of success, and suitability to the program.

Program of Study

The student must complete an approved program of study, including a minor, typically including approximately 54 credit hours. The minor is interdisciplinary and may be satisfied by 9 hours of graduate work outside the mathematics department, by 6 credit hours for a project in an area of application, or by a combination of external coursework and directed project in an area of application totaling 9 credit hours.

Each student will have an advisory committee appointed by the department Graduate Committee in consultation with the student and approved by the Department Chair. It includes the prospective dissertation adviser as chair, or co-chair, if the dissertation adviser is not a member of the Department of Mathematics. The advisory committee should be appointed as soon as is feasible, usually within a year after passing the Preliminary Examination. Once formed, it will have the responsibility of constructing and approving the program of study which includes the minor. Prior to the appointment of the advisory committee the student will be advised by a graduate faculty member appointed by the department Graduate Committee.

Grades

A student is expected to achieve A's or B's in all courses included in the program of study and must have at least a 3.0 GPA to graduate. The dissertation is graded on a

pass/unsatisfactory basis and, therefore, will not be included in the cumulative average. An accumulation of more than two marginal (C) grades will result in termination of the student's enrollment in the program. If a student makes a grade of *U* on any course, enrollment will be terminated and the student cannot take further graduate work without being readmitted to the program. Readmission to the program requires approval of the Dean of the Graduate School upon the recommendation of the department Graduate Committee.

Transfer Credit

Only courses with grades of A or B may be accepted for transfer credit. Transfer credit must be approved by the department Graduate Committee, and cannot exceed the limit set by the Graduate School.

Preliminary Examination

The student is expected to take the preliminary examination within three semesters of being admitted to the Ph.D. program. The examination consists of two parts: a written examination based on Real Analysis I and II (8143-8144) and a written examination based on two other related courses chosen by the student and approved by the department Graduate Committee. The student must pass both examinations in a single attempt in order to pass the preliminary examination. At the discretion of the department Graduate Committee, the student may be allowed to retake the preliminary examination a second time if the student does not pass on the first attempt. A student who fails the preliminary examination twice is disenrolled from the Ph.D. program.

Qualifying Examination and Admission to Candidacy

Each student must pass a comprehensive oral examination covering her/his chosen field of research and related advanced course work. The exam is conducted by the student's Advisory Committee and may include an additional written examination. The exam is open to the graduate faculty of the department. The student is expected to take the qualifying examination within two years of the appointment of the student's Advisory Committee. A student who fails the qualifying examination twice is disenrolled from the Ph.D. program. The dissertation topic may be proposed after the student has passed the qualifying examination. A doctoral student advances to candidacy after the dissertation topic has been approved by the student's advisory committee and the Dean of the Graduate School.

Dissertation

The student must complete and defend a dissertation based on a research program approved by the student's dissertation adviser which results in a high quality, original and substantial piece of research. The student must orally present and successfully defend the dissertation before the student's Advisory Committee in a defense that is open to the public. A copy of the dissertation must be made available to the graduate faculty of the department at least two weeks prior to the public defense. The dissertation will be graded on a pass/no credit basis by the Advisory Committee and must be approved by the Department Chair and the Dean of the Graduate School.

Residency Requirement

The full-time Ph.D. student must enroll for one continuous full-time year (i.e. two consecutive semesters of at least nine graduate credit hours in each semester) following admission to the program.

Language and Research Tool Requirements

Each student must demonstrate a reading knowledge of French, German or Russian by passing a written translation exam in one of these languages conducted by the Mathematics Department. In addition, the student must demonstrate significant computer expertise applicable to research or teaching in his or her major field as approved by the student's Advisory Committee. The computer expertise requirement may include course work or work on a project and may overlap with the minor requirement.

Time Limit for Degree Completion

The student must achieve admission to candidacy within six years after admission to the program and complete all requirements within six years after admission to candidacy for the Ph.D. degree. All requirements for the degree must be completed within eight years after first registration as a doctoral student.

Courses in Mathematics and Mathematics Education

Mathematics:

MATH 5000. Topics in Foundations or History of Mathematics. (2-3) Prerequisite: consent of the department. Topics in the foundations or the history of mathematics selected to supplement regular course offerings in this area of mathematics. May be repeated for credit with approval of the department. Credit for the M.A. degree in mathematics requires approval of the department. (*On demand*)

MATH 5040. Topics in Analysis. (2-3) Prerequisite: consent of the department. Topics in the foundations or the history of mathematics selected to supplement regular course offerings in this area of mathematics. May be repeated for credit with the approval of the department. Credit for the M.A. degree in mathematics requires approval of the department. (*On demand*)

MATH 5060. Topics in Algebra. (2-3) Prerequisite: consent of the department. Topics in algebra selected to supplement regular course offerings in this area of mathematics. May be repeated for credit with the

approval of the department. Credit for the M.A. degree in mathematics requires approval of the department. (*On demand*)

MATH 5080. Topics in Geometry and Topology. (3) Prerequisite: consent of the department. Topics in geometry or topology selected as to supplement regular course offerings in this area of mathematics. May be repeated for credit with approval of the department. Credit for M.A. degree in mathematics requires approval of the department. (*On demand*)

MATH 5109. History of Mathematical Thought. (3) Prerequisite: MATH 1241 or consent of the department. A study of the development of mathematics in its historical setting from the earliest beginnings to modern times. Not approved for the M.A. in mathematics degree. (*Fall*) (*Evenings*)

MATH 5128. Applied Probability I. (3) Prerequisite: MATH/STAT 3122 and MATH 2171 or consent of the department. Finite and countable Markov chains, Markov Decision Processes, and optimal stopping. Other topics selected from: queuing theory, inventory models, reliability theory, game theory, recurrent events, information theory, stochastic control, stochastic control with incomplete information and Kalman filtering. *(Fall)(Alternate years)*

MATH 5129 Applied Probability II. (3) Prerequisite: MATH 5128 or consent of the department. Continuation of MATH 5128. *(Spring)(Alternate years)*

MATH 5143. Analysis I. (3) Prerequisite: MATH 3141 with a grade of *B* or better, or consent of the department. First course of a two-semester sequence providing a rigorous treatment of continuity, differentiability and integration of functions of one and several real variables. *(Fall)*

MATH 5144. Analysis II. (3) Prerequisite: MATH 5143 with a grade of *B* or better or consent of the department. Continuation of MATH 5143. *(Spring)*

MATH 5161. Number Theory. (3) Prerequisite: MATH 3163 with a grade of *C* or better or consent of the department. A study of the elements of classical number theory including divisibility, congruences, diophantine equations, prime numbers and their distribution, quadratic reciprocity, number-theoretic functions, and famous unsolved problems. Not approved for the M.A. in mathematics degree. (*Spring*) (*Alternate years*)

MATH 5163. Modern Algebra. (3) Prerequisite: MATH 3163 or consent of the department. Groups, rings, integral domains, fields. (*Fall*) (*Alternate years*)

MATH 5164. Abstract Linear Algebra. (3) Prerequisite: MATH 3163 and 2164 or consent of the department. Vector spaces over arbitrary fields, linear transformations, canonical forms, multilinear algebra. (*Spring*) (*Alternate years*)

MATH 5165. Numerical Linear Algebra. (3) Prerequisites: CSCI 1100 or 1201 and 1201L, MATH 2164 and 2171, all with a grade of C or better, or consent of the Department. Gaussian elimination and LU decomposition methods for linear systems. Vector and matrix norms, condition numbers and accuracy of solutions. Solutions of large sparse matrix systems using skyline solvers, and Jacobi, Gauss-Seidel, and SOR iterative methods. Solution of nonlinear systems. Least squares methods using the QR factorization. Selected problems will be programmed for computer solution. *(Fall) (Alternate years)*

MATH 5171. Numerical Solution of Ordinary Differential Equations. (3) Prerequisites: CSCI 1100 or 1201 and 1201L, MATH 2241, 2164, and 2171, all with a grade of C or better, or consent of the Department. Numerical solution techniques for ordinary differential equations such as Runga-kutta, multistep and extrapolation methods. Stiff solvers and stability criteria. Comparative work with modern robust codes and visualization methods. *(On demand)*

MATH 5172. The Finite Element Method. (3) Prerequisites: CSCI 1100 or 1201 and 1201L, MATH 2241, 2164, and 2171, all with a grade of *C* or better, or consent of the department. Boundary value problems and their variational form. Finite element basis functions, computational techniques, isoparametric elements and curved boundaries, alternate methods, singular problems, eigenvalue problems. Some practical experience with an F.E.M. program and graphical output. *(Spring)* (*Alternate years*)

MATH 5173. Ordinary Differential Equations. (3) Prerequisites: MATH 2171 and MATH 3142, or consent of the department. Existence and uniqueness theorems for initial value problems; continuous dependence of solutions on initial values and right hand sides; linear differential equations in R^2 and R^n; non-linear differential equations in R^2 and R^n: phase portraits, singularities, cycles; invariant manifolds; linearization; singularities of planar systems; Lyapunov stability; examples: van der Pol oscillator, Liénard systems, Volterra-Lotka equations. *(Spring)*

MATH 5174. Partial Differential Equations. (3) Prerequisites: MATH 2164 and MATH 3141, or consent of department. Classification of types of partial differential equations. Separation of variables, Sturm-Liouville problems, boundary and eigenvalue problems, fundamental solutions and Green's theorem, Fourier series and integrals, Laplace transforms. *(Fall)*

MATH 5176. Numerical Methods for Partial Differential Equations. (3) Prerequisite: CSCI 1100 or 1201 and 1201L, MATH 2241, 2164, and 2171 all with a

grade of C or better, or consent of the department. Basic finite difference schemes for the solutions of elliptic, parabolic and hyperbolic equations. Van Neuman analysis, characteristics, boundary conditions. *(Fall) (Alternate years)*

MATH 5181. Introduction to Topology. (3) Prerequisite: MATH 2164 with a grade of C or better. Topics from set theory and point set topology such as cardinality, order, topological spaces, metric spaces, separation axioms, compactness and connectedness. *(Fall) (Alternate years)*

MATH 5691. Seminar. (1-6) Prerequisite: consent of the department. Individual or group investigation and exposition of selected topics in mathematics. *(On demand)*

MATH 5692. Seminar. (1-6) Prerequisite: consent of the department. A continuation of MATH 5691. *(On demand)*

MATH 6004. Topics in Analysis. (3) Prerequisite: MATH 6101 or consent of department. Topics in analysis selected so as to complement regular course offerings in this area of mathematics. May be repeated for credit with the consent of department. *(On demand)*

MATH 6008. Topics in Geometry and Topology. (3) Prerequisite: consent of department. Topics selected from Euclidean geometry, non-Euclidean geometry, projective geometry, differential geometry, point-set topology, algebraic topology. May be repeated for credit with approval of department. *(On demand)*

MATH 6100. Foundations of Mathematics. (3) Prerequisite: consent of department. Logic, sets and axiomatic systems. *(Fall, Summer) (Alternate years)*

MATH 6101. Foundations of Real Analysis. (3) Prerequisite: MATH 6100 or consent of department. Axiomatic and historical development of the real and complex numbers; rigorous development of limits and continuity of functions, intermediate and extreme value theorems. *(Fall) (Alternate years)*

MATH 6102. Calculus from an Advanced Viewpoint. (3) Prerequisite: MATH 6101 or its equivalent. A continuation of MATH 6101. A rigorous approach to differentiation and integration of functions of one real variable. *(Spring) (Alternate years)*

MATH 6103. Computer Techniques and Numerical Methods. (3) Prerequisite: MATH 6101 or consent of department. Computer systems, programming, and the computer solution of numerical problems. *(Summer) (Alternate years)*

MATH 6105. Problem Solving in Discrete Mathematics. (3) Prerequisite: consent of department. Propositional and predicate calculus, counting techniques, partially ordered sets, lattices, graphs and trees. *(Alternate years)*

MATH 6106. Modern Algebra. (3) Prerequisite: MATH 3163 or its equivalent or consent of department. Topics chosen from group theory, rings and ideals, integral domains, fields and elementary Galois theory. *(Summer) (Alternate years)*

MATH 6107. Linear Algebra. (3) Prerequisite: MATH 2164 or its equivalent or consent of department. Systems of linear equations, matrices, vector spaces, linear transformations, determinants, canonical forms of matrices, inner products. *(Summer) (Alternate years)*

MATH 6118. Non-Euclidean Geometry. (3) Prerequisite: consent of department. History of Euclid's Fifth Postulate and attempts to prove it; work of Gauss, Bolyai, Lobachevsky and others; systematic development of hyperbolic geometry; relative consistency of hyperbolic geometry; relative consistency of hyperbolic and Euclidean geometries. *(Alternate years)*

MATH 6171. Advanced Applied Mathematics I. (3) Prerequisites: MATH 2241 and 2171 with grades of C or better, or consent of department. Power series solutions of ordinary differential equations, vector calculus, line and surface integrals, partial differential equations and Fourier integrals. *(Fall) (Evenings)*

MATH 6172. Advanced Applied Mathematics II. (3) Prerequisites: MATH 2241 and 2171 with grades of C or better or consent of department. Complex analysis; probability and statistics. *(Spring) (Evenings)*

MATH 6609. Seminar. (1-3) Prerequisite: consent of the department. A series of regularly scheduled meetings in which each student will present one or more topics selected by the instructor. May be repeated for credit with the consent of department. *(On demand)*

MATH 7028. Topics in Probability. (3) Prerequisite: MATH 7120 and 7121, or consent of department. Topics of current interest in probability and advanced topics in probability. May be repeated for credit with the consent of the department. *(On demand)*

MATH 7050. Topics in Mathematics. (2-3) Prerequisite: consent of department. Topics chosen from such fields as algebra, topology, analysis, applied mathematics, differential geometry, mathematical physics, graph theory, probability, statistics. May be repeated for credit as topics vary and with the approval of the department. *(On demand)*

MATH 7065. Topics in Applied Algebra and Algebraic Structures. (3) Prerequisite: consent of the department. Current topics in Applied Algebra and Algebraic Structure. *(On demand)*

MATH 7070. Topics in Numerical Analysis. (3) Prerequisite: consent of the department. Topics of current interest in numerical analysis. May be repeated for credit with the consent of the department. *(On demand)*

MATH 7071. Topics in Differential Equations. (3) Prerequisite: consent of the department. Topics of current interest in ODE, PDE, dynamical systems, inverse problems and related subjects. May be repeated for credit with the consent of the department. *(On demand)*

MATH 7120. Probability Theory I. (3) Prerequisites: MATH 7143 and MATH/STAT 3122 or consent of department. Topics include probability spaces, probability measures, sigma-algebras, characteristic functions, sequences of random variables, law of large numbers, general forms of the Central Limit Theorem. *(Fall) (Alternate years)*

MATH 7121. Probability Theory II. (3) Prerequisite: MATH 7120 or consent of the department. A continuation of MATH 7120. *(Spring) (Alternate years)*

MATH 7125. Stochastic Processes I. (3) Prerequisites: MATH 3122 and 7143 or consent of the department. Basic ideas in the study of stochastic processes, selected from: discrete and continuous time Markov processes, stationary and renewal processes, applications to queuing theory, reliability theory, stochastic differential equations, time-series analysis, filtering and stochastic control theory. *(On demand)*

MATH 7126. Stochastic Processes II. (3) Prerequisite: MATH 7125. A continuation of MATH 7125. *(On demand)*

MATH 7141. Complex Analysis I. (3) Prerequisite: MATH 5143 or consent of the department. Holomorphic functions, complex integration, residues, entire and meromorphic functions, conformal mapping, harmonic functions. *(Spring) (Alternate years)*

MATH 7142. Complex Analysis II. (3) Prerequisite: MATH 7141. A continuation of MATH 7141. *(On demand)*

MATH 7143. Real Analysis I. (3) Prerequisite: MATH 5144 or consent of the department. Lebesgue integration on the real line, Lp spaces, introduction to general measure and integration theory. *(Fall)*

MATH 7144. Real Analysis II. (3) Prerequisite: MATH 7143 or consent of the department. A continuation of MATH 7143. *(Spring)*

MATH 7147. Applied Functional Analysis. (3) Prerequisite: MATH 5144. Introduction to functional analysis and its applications to such areas as linear and non-linear differential equations, integral equations, and control theory. Topics chosen from Banach spaces, operators, the Hahn-Banach, open mapping and closed graph theorems, Sobolev spaces, spectral theory, operators in Hilbert space. *(Summer) (On Demand)*

MATH 7148. Functional Analysis. (3) Prerequisite: MATH 7144 or consent of the department. Material selected from: spectral theory, spectral theory of differential operators, groups and semigroups of operators, nonlinear functional analysis, asymptotic analysis, integral equations, Fourier analysis, distributions, and Sobolev spaces. *(Fall)(Alternate years)*

MATH 7163. Modern Algebra I. (3) Prerequisite: MATH 4163 and 4164 or consent of department. Topics will be selected from Galois theory, commutative algebra, modules, ring theory, homological algebra. *(Fall) (Alternate years)*

MATH 7164. Modern Algebra II. (3) Prerequisite: MATH 7163. A continuation of MATH 7163. *(On demand)*

MATH 7172. Partial Differential Equations. (3) Prerequisite: MATH 5174 and 7144 or consent of department. Harmonic functions, mean-value theorem, maximum principle, Green's representation for the solution of the Dirichlet problem for Laplace's equation; Poisson's equations and the Poisson formula; statement and proof of the existence theorem for general second-order elliptic operators, generalized maximum principles; Sobolev spaces. Evolution equations involving elliptic operators, such as the heat or wave equations, may also be introduced. *(Spring) (Alternate years)*

MATH 7173. Evolution Equations. (3) Prerequisite: MATH 7144 and 7172 or consent of the department. Semigroups of operators and their generators, examples of semigroups. The heat equation, examples of elliptic operators that generate semigroups, Hille-Yosida theory, analytic semigroups; examples, fractional powers of operators. *(On demand)*

MATH 7174. Linear and Non-linear Waves. (3) Prerequisite: MATH 5124 and 7144 or consent of the department. Hyperbolic waves, characteristics, Riemann invariants, conservation laws, weak solutions, shock structure. Burger's equation, gas dynamics, dispersive waves, group velocity, water waves, non-linear optics. *(On demand)*

MATH 7175. Inverse Problems. (3) Prerequisite: MATH 7144 and MATH 5174 or consent of the department. Ill-posed problems and numerical methods for them. Applications of inverse problems to real processes. One dimensional inverse problems. Multi-dimensional inverse problems: uniqueness and numerical methods. Inverse scattering problems. *(On demand)*

MATH 7176. Advanced Numerical Analysis. (3) Prerequisites: MATH 2164, 2171 and 5176 or consent of

the department. A selection of topics from such areas as iterative methods of solving linear and non-linear systems of equations, approximation theory, splines, and finite element methods for partial differential equations. *(Spring) (Alternate years)*

MATH 7177. Applied Optimal Control. (3) Prerequisites: MATH 5143 or consent of the department. Examples of control systems and optimization problems, optimal control of discrete-time systems, solutions of the general discrete-time optimization problem, optimal control of continuous-time systems, the calculus of variations, solution of the general continuous optimization problem, applications of the Pontryagin Maximum Principle, Dynamic programming, and Bang-bang control. Controllability and differential games may also be introduced. *(Spring) (Alternate years)*

MATH 7178. Computational Methods for Fluid Dynamics. (3) Prerequisite: CSCI 1100 or 1201 and 1201L, MATH 2242, 2171, 5174 and 5176 or consent of the department. Topics on various numerical techniques for the solution of incompressible and compressible flows. Finite difference, finite element and spectral methods, and shock capturing and fitting methods. Multi-grid method and acceleration techniques. *(On demand)*

MATH 7179. Advanced Finite Difference Methods. (3) Prerequisite: consent of the department. Accuracy analysis and design of high order schemes, stability theory of schemes with variable coefficients, stability theory of schemes for initial-boundary value problems, convergence theory for nonlinear cases. *(On demand)*

MATH 7181. Topology I. (3) Prerequisite: consent of department. Topological spaces, continuous functions, connectedness, compactness, and metrizability, and further topics from point-set, geometric or algebraic topology. *(On demand)*

MATH 7182. Topology II. (3) Prerequisite: MATH 7181. A continuation of MATH 7181. *(On demand)*

MATH 7184. Differential Geometry I. (3) Prerequisite: consent of the department. Manifolds, differential structures, tangent bundles, embeddings, immersions, inverse function theorem, Morse-Sard theorem, transversality, Borsuk-Ulam theorem, vector bundles, Euler characteristics, Morse theory, Stokes theorem, Gauss-Bonnet theorem, Whitney embedding theorem. *(On demand)*

MATH 7185. Differential Geometry II. (3) Prerequisite: consent of the department. Differentiable manifolds, differential forms, critical points, local and global theory of curves, local and global theory of surfaces, connections, geodesics, curvature, spaces of constant curvature, Lie groups and Lie algebras. *(On demand)*

MATH 7273. Advanced Finite Element Analysis. (3) Prerequisite: MATH 5172 and 5174 or consent of the department. Selection of topics from such areas of finite element analysis as convergence theorems (Ciarlet), hierarchical basis functions, the h-p method, adaptive grid techniques and solution methods for nonlinear equations. *(Fall)(Alternate years)*

MATH 7275. Dynamical Systems I. (3) Prerequisites: MATH 5143 and MATH 5173 or consent of the department. Cycles and separatrix cycles, Poincaré first-return map: diffeomorphisms, Poincaré-Bendixson Theory, flows on the two-torus; structural stability, genericity, Peixoto's theorem; singularities of planar systems. Degenerate singularities, Hopf bifurcation, saddle-node bifurcation, center bifurcation. *(On demand)*

MATH 7276. Dynamical Systems II. (3) Prerequisite: MATH 7275 or consent of the department. Method of averaging, Melnikov functions, hyperbolic structure, symbolic dynamics, homoclinic and heteroclinic orbits, global bifurcations, infinite dimensional dynamical systems, inertial manifolds, Lyapunov exponents and dimension of attractors, codimension-two bifurcations, Duffing's equation, Lorenz equations, finite dimensional systems of dimension at least three. *(On demand)*

MATH 7277. Bifurcation Theory. (3) Prerequisite: MATH 7275 or consent of the department. Implicit function theorem, manifolds and transversality, Newton polygons, Lyapunov center theorem, variational methods, Ljusternik-Schnirelman theory, mountain-pass theorem, bifurcations with one-dimensional null-spaces, Morse theory and global bifurcations, geometric theory of partial differential equations. *(On demand)*

MATH 7691. Research Seminar. (1-3) Prerequisite: consent of department. A seminar in which independent study may be pursued by the student or a group of students under the direction of a professor. *(On demand)*

MATH 7692. Research Seminar. (1-3) Prerequisite: consent of department. A continuation of MATH 7691. *(On demand)*

MATH 7893. Thesis. (0-3) Prerequisite: consent of department. Subject to the approval of the department Graduate Committee, the thesis may be original work, work of an expository nature, or the mathematical formulation and solution of a particular industrial or business problem suggested by the career interests of the student. The thesis must be defended in an oral presentation. May be repeated for credit with the consent of department. *(Fall, Spring, Summer)*

MATH 8028. Topics in Probability. (3) See MATH 7028 for Course Description.

MATH 8050. Topics in Mathematics. (2-3) See MATH 7071 for Course Description.

MATH 8065. Topics in Applied Algebra and Algebraic Structures. (3) See MATH 7065 for Course Description.

MATH 8070. Topics in Numerical Analysis. (3) See MATH 7070 for Course Description.

MATH 8071. Topics in Differential Equations. (3) See MATH 7071 for Course Description.

MATH 8120. Probability Theory I. (3) See MATH 7120 for Course Description.

MATH 8121. Probability Theory II. (3) See MATH 7121 for Course Description.

MATH 8125. Stochastic Processes I. (3) See MATH 7125 for Course Description.

MATH 8126. Stochastic Processes II. (3) See MATH 7126 for Course Description.

MATH 8141. Complex Analysis I. (3) See MATH 7141 for Course Description.

MATH 8142. Complex Analysis II. (3) See MATH 7142 for Course Description.

MATH 8143. Real Analysis I. (3) See MATH 7143 for Course Description.

MATH 8144. Real Analysis II. (3) See MATH 7147 for Course Description.

MATH 8147. Applied Functional Analysis. (3) See MATH 7147 for Course Description.

MATH 8148. Functional Analysis. (3) See MATH 7148 for Course Description.

MATH 8163. Modern Algebra I. (3) See MATH 7163 for Course Description.

MATH 8164. Modern Algebra II. (3) See MATH 7164 for Course Description.

MATH 8172. Partial Differential Equations. (3) See MATH 7172 for Course Description.

MATH 8173. Evolution Equations. (3) See MATH 7173 for Course Description.

MATH 8174. Linear and Non-linear Waves. (3) See MATH 7174 for Course Description.

MATH 8175. Inverse Problems. (3) See MATH 7175 for Course Description.

MATH 8176. Advanced Numerical Analysis. (3) See MATH 7176 for Course Description.

MATH 8177. Applied Optimal Control. (3) See MATH 7177 for Course Description.

MATH 8178. Computational Methods for Fluid Dynamics. (3) See MATH 7178 for Course Description.

MATH 8181. Topology I. (3) See MATH 7181 for Course Description.

MATH 8182. Topology II. (3) See MATH 7182 for Course Description.

MATH 8184. Differential Geometry I. (3) See MATH 7184 for Course Description.

MATH 8185. Differential Geometry II. (3) See MATH 7185 for Course Description.

MATH 8273. Advanced Finite Element Analysis. (3) See MATH 7273 for Course Description.

MATH 8275. Dynamical Systems I. (3) See MATH 7276 for Course Description.

MATH 8276. Dynamical Systems II. (3) See MATH 7276 for Course Description.

MATH 8277. Bifurcation Theory. (3) See MATH 7277 for Course Description.

MATH 8691. Research Seminar. (1-3) See MATH 7691 for Course Description.

MATH 8692. Research Seminar. (1-3) See MATH 7692 for Course Description.

MATH 8994. Doctoral Research and Reading. (0-9) Prerequisite: consent of the department. May be repeated with consent of the department. *(On demand)*

Mathematics Education:

MAED 5000. Topics in Mathematics Education, Early Childhood. (1-6) Prerequisite: consent of department. *(On demand)*

MAED 5040. Topics in Mathematics Education, Intermediate. (1-6) Prerequisite: consent of department. *(On demand)*

MAED 5070. Topics in Mathematics Education, Secondary. (1-6) Prerequisite: consent of department. *(On demand)*

MAED 5101. Arithmetic in the School. (3) Prerequisite: MATH 1100 or equivalent. A study of the number systems with emphasis placed upon the basic concepts and meanings, properties of addition, multiplication, inverses, systems of numeration and number line appropriate for each grade. (Does not count toward a major in mathematics. Open only to transfer

students who have completed six semester hours of mathematics at another university.) *(On demand)*

MAED 5104. Microcomputing for Teachers. (3) Prerequisites: working knowledge of college algebra and trigonometry, and consent of department. Introduction to basic computer concepts, to microcomputer systems, to the design and development of programs to assist instruction in mathematics and computer sciences. A programming language such as BASIC or LOGO will be used. Each student will integrate skills learned by selecting, designing and developing a specific project. (No prior experience with computer programming required.) *(Spring) (Evenings)*

MAED 5105. Geometry for Teachers. (3) Prerequisite: MATH 2102 or MAED 5101 or consent of department. A study of the foundations of Euclidean geometry and a brief treatment of non-Euclidean geometry. Emphasis on learning activities and teaching techniques for teachers of mathematics K-12. *(Spring) (Evenings)*

MAED 5141. Mathematics for the Intermediate School Teacher. (3) Prerequisite: MATH 2102 or consent of department. A study of the algebraic properties of the real numbers; functions, equations, inequalities and their graphs, activities and applications related to upper elementary and intermediate grades. *(Fall) (Evenings)*

MAED 6120. Research in Mathematics Education. (3) Prerequisites: Students must be enrolled in the Masters of Arts in Mathematics Education Program. An introduction and overview of research in the teaching and learning of mathematics in K-12. Overview of contemporary research perspectives and paradigms; interpreting and synthesizing the research literature; survey of contemporary research problems in mathematics teaching and learning; development of classroom-based research studies. *(Alternate years)*

MAED 6122. Theoretical Foundations of Learning Mathematics. (3) Prerequisites: Students must be enrolled in the Masters of Arts in Mathematics Education Program. Introductions to theories of learning that have influenced the teaching of mathematics in K-12. An overview of theories that have guided reforms in mathematics teaching; contemporary constructivist theories of mathematics learning. *(Alternate years)*

MAED 6124. Issues in the Teaching of Secondary School Mathematics. (3) Prerequisites: Students must be enrolled in the Masters of Arts in Mathematics Education Program. Study of major issues affecting secondary mathematics education: analysis of the impact of learning theories on methods of teaching; assessment methods for improving mathematics learning; analysis of the historical and programmatic development of the secondary school mathematics curriculum leading to current trends, issues, and problems; and analysis of the role of technology in the secondary mathematics classroom. *(Alternate years)*

NURSING

There are several programs in the College of Nursing and Health Professions. After the directory and general information below, you will find specific information for each program. The programs include: Adult Health Nursing, Community Health Nursing, Family Nurse Practitioner, Psychiatric/Mental Health Nursing, Nurse Anesthesia, and the MSN/MHA.

College of Nursing and Health Professions

2008 Colvard Building
http://www.uncc.edu/colleges/health/

Department of Adult Health Nursing

2046 Colvard Building
(704) 547-4652

Department of Family and Community Nursing

2038 Colvard Building
(704) 547-4683

Coordinators

Adult Health
Dr. Gloria Hagopian
Dr. Linda Steele

Community Health Nursing
Dr. David Langford

Family Nurse Practitioner
Dr. Linda Steele

Psychiatric/Mental Health
Dr. Ann Newman

Nurse Anesthesia
Dr. Leslie Hussey

MSN/MHA
Dr. Sonya Hardin

Degrees

M.S.N., M.S.N./M.H.A.

MASTER OF SCIENCE in NURSING

The NLN-accredited Master of Science in Nursing degree is designed to prepare the nurse for advanced practice in a specialized area of nursing as clinical nurse specialist, nurse practitioner or nurse administrator. Six specialty concentrations are available:

Care of the Chronically Ill Adult
Community Health Nursing
Family Nurse Practitioner
Psychiatric/Mental Health Nursing
Nurse Anesthesia
MSN/MHA: dual degree program in Nursing and Health Administration

Additional Admission Requirements

In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Nursing:

1) Current unrestricted licensure as a Registered Nurse. Current licensure to practice nursing in North Carolina or the state identified by faculty for clinical practice is required for progression into clinical courses.
2) Baccalaureate degree from a National League for Nursing accredited nursing program.
3) Satisfactory performance on the Aptitude Portion of the Graduate Record Exam or the Miller Analogies Test.
4) One year of professional nursing practice following completion of the baccalaureate degree is recommended.
5) Overall GPA of at least 3.0 on the last 60 semester hours attempted.
6) Completion of a statistics course with a grade of Cor better.

Early Entry Program for the Master of Science in Nursing

A student would make application in their first semester of the RN/B.S.N. program. They must obtain satisfactory scores on GREs or MATs as do other nursing graduate students, have a GPA of at least 3.2 overall, at least 75 hours completed, and the usual letters of recommendation. Must also have at least one year nursing practice if they have a B.S. or B.A. in another field or two years nursing practice if they come from a diploma or associate Degree program, and they must have at least 9 hours of work at a senior university. Student would be admitted to either of the following programs: Community Health, Adult Health or Psych/Mental Health Nursing. A student may submit an application after completion of at least 75 undergraduate hours. A student may not be admitted into the program until completion of at least 90 undergraduate hours.

Admission is conditional based upon evidence of successful completion of computer-based module on basic research/nursing theory, completion of the B.S.N., and maintenance of a GPA of at least 2.75 and 3.0 on the last 60 hours of nursing courses.

On conditional admission to the MSN program, six graduate credit hours will be substituted for the six required undergraduate hours. NURS 6101 will be substituted for NURS 4090. NURS 6160 will be substituted for NURS 4090. NURS 6115 will be substituted for NURS 3251. Students will not be required to complete a computer based module on basic research/ nursing theory prior to enrollment in either NURS 6101 or NURS 6160 in that all students will complete NURS 3200 Research and Theoretical Foundations of Nursing. The designated graduate courses are MSN courses required of all students in the MSN program regardless of the clinical specialty concentration.

Degree Requirements

The MSN specialty concentrations require completion of 42 to 63 graduate credit hours depending on the specialty. Specific requirements and prerequisites for each program are listed below. Most programs are designed to accommodate full-time and part-time students and many classes are held in the evening to serve students who are employed.

Graduate transfer credit may be accepted from another accredited institution for up to six semester hours upon approval of the student's adviser, the department chair and the Dean of the Graduate School. All course work, including accepted transfer credits, must be completed within a six-year period.

Assistantships

A limited number of graduate assistantships are available. Information about them is available in each Department and the Office of the Associate Dean for Academic Affairs, College of Nursing and Health Professions.

Additional Financial Aid

Scholarships from the North Carolina Nurse Scholars Program - Master's Program (M-NSP) are available to part-time or full-time students admitted to the nursing program for up to two years of study. The M-NSP scholarships are competitive and preference will be given to full-time students. Awards are not based on financial need. The application deadline is early May. Further information and application forms are available in the Office of Student Services in the College of Nursing and Health Professions.

A limited number of Professional Nurse Traineeships are available to full-time graduate nursing students admitted to a clinical specialty concentration. The traineeship awards provide in-state tuition/fees and a small stipend. Further information and application forms are available

from the Office of the Associate Dean for Academic Affairs, College of Nursing and Health Professions.

ADULT HEALTH NURSING

Graduate Faculty

Mary Curran, Associate Professor
Gloria Hagopian, Professor
Sonya Hardin, Assistant Professor
Leslie Hussey, Associate Professor
Linda Moore, Associate Professor
Linda Steele, Assistant Professor
Shirley Travis Professor
Margaret Wilmoth, Associate Professor

Advanced Practice Registered Nursing in Adult Chronic Care

The program will lead to a Master of Science in Nursing degree, with a concentration in Adult Health Nursing. These advanced practice registered nurses will be prepared to function as clinical nurse specialists and/or adult nurse practitioners in a blended role with a specialty in chronic illness care and will function in diverse settings. The graduates of the program will be advanced practice nurses with an expertise in chronic illness who will possess advanced clinical diagnostic and reasoning skills to manage and prescribe health care for adults with chronic illness, identify high risk behaviors that have the potential to lead to chronic illness, provide health promotion and disease prevention instruction and collaborate with patients and their families to manage care.

Degree Requirements

Nursing Core (9 hours)

NURS 6101	Theoretical Basis for Nursing Practice (3)
NURS 6160	Research in Nursing and the Health Professions (3)
NURS 6115	Health Policy and Planning in the US (3)

Cognate Courses (6 hours)

BIOL 6050	Special Topics in Physiology (Pathophysiology) (3)
RSCH 6110	Descriptive and Inferential Statistics in Education (3)

Advanced Practice Specialty Core (8 hours)

NURS 6230	Health Assessment for Advanced Nursing Practice (3)
NURS 6220	Pharmacotherapeutics in Advanced Nursing Practice (3)
NURS 6105	Roles and Issues in Advanced Practice Nursing (2)

Specialty Concentration (24 hours)
Specialty concentration courses emphasize advanced preparation in the specialized area of chronic illness nursing practice. The required courses include:

NUCI 6100	Chronic Illness Concepts and Theories (3)
NUCI 6106	Health Care Management of Adults I (3)
NUCI 5107	Health Care Management of Adults II (3)
NUCI 6401	Advanced Practice Nursing in Ambulatory Care (4)
NUCI 6402	Advanced Practice Nursing in Acute Care (4)
NUCI 6403	Advanced Practice Nursing in Chronic Care (4)
NUCI 6601	Synthesis in Advanced Practice Nursing of Chronically II Adults (3)

Assistantships

Graduate Assistantships available for master's degrees students are limited in number. For information on graduate assistantships and other financial aid, please contact the Office of Student Services, College of Nursing & Health Professions, UNC Charlotte, 9201 University City Blvd. Charlotte, NC 28223-0001 (704) 547-4684.

Practica

NUCI 6401	Advanced Practice Nursing in Ambulatory Care (4)
NUCI 6403	Advanced Practice Nursing in Chronic Care (4)
NUCI 6402	Advanced Practice Nursing in Acute Care (4)

Capstone Experiences

NUCI 6601	Synthesis in Advanced Practice Nursing of Chronically Ill Adults (3)

Advising

Faculty advising is required each semester.

Licensure

Current unencumbered licensure as a registered Nursing in North Carolina

Research Opportunities/Experiences

Students who choose to do so will have the opportunity to serve as Research Assistants on faculty research projects.

Financial Assistance

For information on financial aid, please contact the Office of Student Services, College of Nursing & Health Professions, UNC Charlotte, 9201 University City Blvd. Charlotte, NC 28223-0001, (704) 547-4684.

Program Certifications/Accreditations

The overall MSN Program is accredited by the NLN and CCNE. Graduates of the program will be eligible to take

the American Nurses Credentialing Center (ANCC) examination for Adult Nurse Practitioners and the Medical-surgical or Gerontological ANCC examination as Clinical Nurse Specialist.

COMMUNITY HEALTH NURSING

Graduate Faculty

William Cody
Gwen Foss
Janice Janken
David Langford

The Community Health Nursing specialty prepares nurses to assess communities, identify high risk populations, and to work with those populations to develop culturally sensitive, acceptable and realistic community-based nursing services. By preparing nurses to develop such services, the program helps meet the health care needs of North Carolina residents who live in urban and rural areas.

Additional Admission Requirements

In addition to the general requirements for admission to the Graduate School, and the M.S.N. degree program, the following are required for graduate study in the Community Nursing concentration:

1) BSN degree from an NLN accredited program with an overall GPA of at least 3.00 (on a 4.0 scale).
2) The Graduate Record Exam (GRE) (score of 500 on each of 2 of the 3 sections) or Miller Analogy Test (MAT) (score of 40 or above).
3) A statement of purpose.

Community Health Nursing has rolling admissions. Applicants may apply any time during the school year.

Prerequisite Requirements

Undergraduate statistics course (with a grade of C or better); one year of professional nursing practice following completion of the baccalaureate degree is recommended. Bachelor of Science in Nursing (BSN) degree from a National League for Nursing or Commission on Collegiate Nursing Education-accredited program, with an overall GPA of at least 2.6 (on a 4.0 scale) and a GPA of at least 3.0 on the last 60 semester hours.

Degree Requirements

The concentration requires completion of 42 semester hours in approved courses, including core courses:

Core Courses (12 hours)

NURS 6101 Theoretical Basis for Nursing Practice (3)
NURS 6160 Research in Nursing and the Health Professions (3)
NURS 6115 Health Policy and Planning in the U.S. (3)
RSCH 6110 Inferential Statistics (3)

Eighteen semester hours are required in specialty courses:

Specialty Concentration (18 hours)

NUCN 6201 Advanced Nursing Care in the Community (3)
NUCN 6202 Organization and Delivery of Health Care in Urban and Rural Environments (3)
NUCN 6203 Addressing Risk in Diverse Populations (3)
NUCN 6405 Community Health Nursing Internship I (3)
NUCN 6406 Community Health Nursing Internship II (3)
NURS 6204 Synthesis in Community Health Nursing (3)

Nine semester hours are required in cognate courses:

Cognate Courses (9 hours)

HPKD 6189 Community Epidemiology (3)
Guided Electives (6)

Assistantships

Graduate Assistantships available for master's degree students are limited in number. For information on graduate assistantships and other financial aid, please contact the Office of Student Services, College of Nursing and Health Professions, UNC Charlotte, 9201 University City Blvd., Charlotte, NC 28223-0001, (704) 547-4684.

Internships

NUCN 6405 Community Health Nursing Internship I (120 hours)
NUCN 6406 Community Health Nursing Internship II (120 hours)

Practica

A total of 240 hours supervised community health nursing practice is required to complete the program.

Capstone Experiences

NUCN 6204 Synthesis in Community Health Nursing (3)

Minors

It is possible to double major in Family Nurse Practitioner.

Advising

Faculty advising is required each semester.

Licensure

Current unencumbered licensure as a Registered Nurse in North Carolina.

Research Opportunities
Students who choose to do so will have the opportunity to serve as Research Assistants on faculty research projects.

Financial Assistance
Federal Traineeships are sometimes available to full time students.

Program Certifications/Accreditations
Overall MSN Program is accredited by the NLN and CCNE.

FAMILY NURSE PRACTITIONER

Graduate Faculty
Kay Boggs, Family & Community Nursing
William Cody, Family & Community Nursing
Mary Curran, Adult Health Nursing
David Langford, Family & Community Nursing
Carolyn Maynard, Family & Community Nursing
Linda Moore, Adult Health Nursing
Linda Steele, Adult Health Nursing

The Family Nurse practitioner (FNP) concentration prepares advanced practice nurses to deliver primary care to families across the life span. The concentration underscores the needs of culturally diverse families in rural and medically underserved areas and equips students to provide comprehensive care in the following areas: prevention, health maintenance, and health promotion. Graduates of this program are eligible to take the American Nurses' Association credentialing examination for FNPs and will be approved to practice as FNPs in North Carolina.

Additional Admission Requirements
Admission is made once per year - applications must be received by March 15 for fall admission.

In addition to the general requirements for admission to the Graduate School, and the MSN degree program, the following are required:
1) Two years of recent clinical practice
2) The Graduate Record Exam (GRE) (score of 500 on each of 2 of the 3 sections) or the Miller Analogy Test (MAT) (score of 40 or above).
3) A statement of purpose that explains the applicant's career goal in relation to family practice.
4) Demonstrated involvement in community service.

Prerequisite Requirements
Undergraduate statistics course; current encumbered licensure as an RN in North Carolina, one to two years recent clinical experience as an RN. Bachelor of Science in Nursing (BSN) degree from a National League for Nursing or Commission on Collegiate Nursing Education-accredited program with an overall GPA of at least 3.0 (on a 4.0 scale) and a GPA of at least 3.0 on the last 60 semester hours.

Degree Requirements
The concentration requires completion of 46 semester hours in approved courses, including core courses:

Core Courses (12 hours)

NURS 6101	Theoretical Basis for Nursing Practice (3)
NURS 6160	Research in Nursing and Health Professions (3)
NURS 6115	Health Policy and Planning in the U.S. (3)
RSCH 6110	Inferential Statistics (3)

Specialty Concentration (28 hours)

NURS 6210	The Family and Health (3)
NURS 6220	Pharmacotherapeutics in Advanced Nursing Practice (3)
NURS 6230	Health Assessment and Diagnostic Reasoning for Advanced Nursing Practice (3)
NUNP 6240	Advanced Primary Care of Women (5)
NUNP 6250	Advanced Primary Care of Adults (5)
NUNP 6260	Advanced Primary Care of Children and Adolescents (5)
NUNP 6400	Internship in Family Health Nursing (4)

Cognate Courses (6 hours)

BIOL 6050	Advanced Human Physiology (3)
BIOL 6050	Advanced Human Pathophysiology (3)

Assistantships
Graduate Assistantships available for master's degree students are limited in number. For information on graduate assistantships and other financial aid, please contact the Office of Student Services, College of Nursing and Health Professions, UNC Charlotte, 9201 University City Blvd., Charlotte, NC 28223-0001 (704) 547-4684.

Internships

NUNP 6400	Internship in Family Health Nursing (240 hours)

Minors
It is possible to double major in Community Health Nursing.

Advising
Faculty advising is required each semester.

Licensure
Current unencumbered licensure as a Registered Nurse in North Carolina.

Research Opportunities
Students who choose to do so will have the opportunity to serve as Research Assistants on faculty research projects.

Financial Assistance
Federal Traineeships are sometimes available to full time students.

Program Certifications/Accreditations
The overall MSN Program is accredited by the NLN and CCNE

Graduates of the program are eligible to take the national American Nurses Association or the American Academy of Nurse Practitioners credentialing examination for FNP's to be approved to practice as FNP's in North Carolina following certification.

PSYCHIATRIC MENTAL HEALTH NURSING

Graduate Faculty
William Cody
Carolyn Maynard
Jane Neese
Ann Newman

The Adult Psychiatric Mental Health Clinical Nurse Specialist track focuses on the role of the advanced PMHN in the assessment and management of individuals, groups, and communities. Graduates of this program will be prepared to complete requirements for certification as a Certified Specialist in Adult Psychiatric and Mental Health Nursing.

Additional Admission Requirements
A Graduate Record Exam (GRE) (score of 500 on each of 2 of the 3 sections) or the Miller Analogy (MAT) (score of 40 or above) is required.

Psychiatric Mental Health Nursing has rolling admissions. Applicants may apply any time during the school year.

Prerequisite Requirements
Undergraduate statistics course (with a grade of C or better); current encumbered licensure as an RN in North Carolina. Bachelor of Science in Nursing (BSN) degree from a National League for Nursing or Commission on Collegiate Nursing Education-accredited program with an overall GPA of at least 3.0 (on a 4.0 scale) and a GPA of at least 3.0 on the last 60 semester hours.

Degree Requirements
This program requires 42 semester hours as follows:

Prerequisite
Computer Competency (0)

Core Courses (12 hours)
- NURS 6101 Theoretical Basis for Nursing Practice (3)
- NURS 6115 Health Policy and Planning in the U.S. (3)
- NURS 6160 Research in Nursing and Health Professions (3)
- RSCH 6110 Inferential Statistics or Equivalent (3)

Specialty Concentration (18 hours)
- NURS 6201 Advanced Care in the Community (3)
- NUMH 6200 Psychiatric Mental Health Theories and Constructs of Mental Health Care (3)
- NUMH 6130 Advanced Psychiatric Mental Health Nursing Practice with Individuals (4)
- NUMH 6135 Advanced Psychiatric Mental Health Nursing Practice with Groups and Communities (4)
- NUMH 6401 Internship in Advanced Psychiatric Mental Health Nursing Practice (4)

Cognate Courses (12 hours)
- NURS 6220 Pharmacotherapeutics for Advanced Nursing Practice (3)
- NURS 6230 Health Assessment for Advanced Nursing Practice (3)
- BIOL 6050 Advanced Human Physiology (3)
- Guided Elective (3)

Assistantships
Graduate Assistantships available for master's degree students are limited in number. For information on graduate assistantships and other financial aid, please contact the Office of Student Services, College of Nursing and Health Professions, UNC Charlotte, 9201 University City Blvd., Charlotte, NC 28223-0001, (704) 547-4684.

Internship
- NUMH 6401 Internship in Advanced Psychiatric-Mental Health Nursing Practice (120 hours)

Practica
A total of 400 hours of supervised clinical practice experience is required to complete the program.

Advising
Faculty advising is required each semester.

Licensure
Current unencumbered licensure as a Registered Nurse in North Carolina.

Research Opportunities
Students who choose to do so will have the opportunity to serve as Research Assistants on faculty research projects.

Financial Assistance
Federal Traineeships are sometimes available to full time students.

Program Certifications/Accreditations
Overall MSN Program is accredited by the NLN and CCNE

NURSE ANESTHESIA
Specialty Concentration

Graduate Faculty
Mary Curran, Associate Professor
Gloria Hagopian, Professor
Jacqueline Hall, Adjunct faculty, Director Nurse Anesthesia Program, CMC
Sonya Hardin, Assistant Professor
Leslie Hussey, Associate Professor
Linda Moore, Associate Professor
Shirley, Travis, Professor
Linda Steele, Assistant Professor
Margaret Wilmoth, Associate Professor

The specialty concentration in Nurse Anesthesia is offered in conjunction with the Carolinas Health Care System and is accredited by the Council on Accreditation of Nurse Anesthesia Education Programs. It provides both the theory and clinical practice required to qualify to take the national certifying examination upon graduation. In addition to MSN core courses, students complete cognate and clinical courses in nurse anesthesia as well as a clinical residency at Carolinas Health Care System.

Additional Admission Requirements
In addition to the requirements of the Graduate School and College, applicants to the Nurse Anesthesia program must have: (1) one year of critical care experience with adult clients; and (2) licensure in Advanced Cardiac Life Support (ACLS).

Degree Requirements
The program requires completion of 63 semester hours in approved courses including:

Core Courses (15 hours)
- NURS 6101 Theoretical Basis for Nursing Practice (3)
- NURS 6115 Health Policy and Planning in the U.S. (3)
- NURS 6160 Research in Nursing and the Health Professions (3)
- RSCH 6110 Inferential Statistics or Equivalent (3)
- BIOL 6050 Advanced Human Physiology (3)

Clinical Concentration (48 hours)
- NUAN 6151 Principles of Anesthesia I (3)
- NUAN 6152 Principles of Anesthesia II (3)
- NUAN 6153 Principles of Anesthesia III (3)
- NUAN 6154 Pharmacology I (4)
- NUAN 6155 Pharmacology II (4)
- NUAN 6156 Applied Physics (3)
- NUAN 6157 Pathophysiology I (3)
- NUAN 6158 Pathophysiology II (3)
- NUAN 6159 Professional Aspects (2)
- NUAN 6485 Clinical Residency I (5)
- NUAN 6486 Clinical Residency II (5)
- NUAN 6487 Clinical Residency III (5)
- NUAN 6489 Clinical Residency IV (5)

Assistantships
Graduate Assistantships available for master's degrees students are limited in number. For information on graduate assistantships and other financial aid, please contact the Office of Student Services, College of Nursing & Health Professions, UNC Charlotte, 9201 University City Blvd. Charlotte, NC 28223-0001 (704) 547-4684.

Practica
- NUAN 6485 Clinical Residency I (5)
- NUAN 6486 Clinical Residency II (5)
- NUAN 6487 Clinical Residency III (5)
- NUAN 6489 Clinical Residency IV (5)

Capstone Experiences
A capstone experience is required throughout the Clinical Residency courses.

Advising
Faculty advising is required each semester.

Licensure
Current unencumbered licensure as a registered Nursing in North Carolina

Research Opportunities/Experiences
Students who choose to do so will have the opportunity to serve as Research Assistants on faculty research projects.

Financial Assistance
The Nurse Anesthesia Traineeship is available for students. For information on financial aid, please contact the Office of Student Services, College of Nursing & Health Professions, UNC Charlotte, 9201 University City Blvd. Charlotte, NC 28223-0001, (704) 547-4684.

Program Certifications/Accreditations
The overall MSN Program is accredited by the NLN and CCNE. Graduate of the program will be eligible to take the AANA certification examination for Certified Registered Nurse Anesthetists.

NURSE ANESTHESIA
Post-Graduate Certificate

The graduate certificate will be awarded to students who have completed a Master of Science in Nursing (MSN) from a National League of Nursing (NLN accredited) program and wish to function as a Certified Registered Nurse Anesthetist (CRNA).

Additional Admission Requirements

1) Personal statement outlining why the applicant seeks admission to graduate certificate program
2) An interview with the Nurse Anesthesia Admissions Committee
3) A Graduate level Physiology course (equivalent to BIOL 6050) within the last 3 years
4) Successful completion of the certificate program with a minimum grade of "B" in NUAN 6154, 6155, 6156,6151, 6152, 6153, 6157, 6158, 6159, or Pass in NUAN 6485, 6486,6487, and 6188 for a total of 48 graduate credit hours must be achieved.

The full-time course of study plan allows for certificate completion within 27 months. Courses must be taken in the order outlined in the master's curriculum. In addition the student must complete all requirements outlined by the Council on Certification of Nurse Anesthetists (CCNA)

Clinical Concentration (48 hours)

NUAN 6151 Principles of Anesthesia I (3)
NUAN 6152 Principles of Anesthesia II (3)
NUAN 6153 Principles of Anesthesia III (3)
NUAN 6154 Pharmacology I (4)
NUAN 6155 Pharmacology II (4)
NUAN 6156 Applied Physics (3)
NUAN 6157 Pathophysiology (3)
NUAN 6158 Pathophysiology II (3)
NUAN 6159 Professional Aspects (2)
NUAN 6485 Clinical Residency I (5)
NUAN 6486 Clinical Residency II (5)
NUAN 6487 Clinical Residency III (5)
NUAN 6489 Clinical Residency IV (5)

Additional Admission Requirements for the Graduate Certificate Program

1) MSN awarded by a college or university accredited by the NLN
2) Current North Carolina registered nursing licensure
3) Completed application to the Graduate Admissions Office
4) A minimum of a GPA of 3.0 in graduate studies
5) Official transcripts of baccalaureate and master's work
6) A minimum of one year of critical care/intensive care experience
7) Current Basic Cardiac Life Support and Advanced Cardiac Life Support certification
8) Successful interview and acceptance by the admission committee of the CMC Nurse Anesthesia Program/UNC Charlotte.

NURSING and MASTER of HEALTH ADMINISTRATION
Master of Science

Graduate Faculty in Nursing

Mary Curran, Associate Professor
Gloria Hagopian, Professor
Sonya Hardin, Assistant Professor
Leslie Hussey, Associate Professor
Linda Moore, Associate Professor
Shirley, Travis, Professor
Linda Steele, Assistant Professor
Margaret Wilmoth, Associate Professor

Graduate Faculty in Health Administration

William Brandon
Carole Jurkiewicz
Gerald Pyle
Linda Swayne
Carolyn Thompson
Rosemarie Tong
Jennifer Troyer

The Master of Science in Nursing and Master of Health Administration program is an interdisciplinary dual degree program designed to prepare nurse executives. This program enables baccalaureate prepared nurses to pursue a degree option which combines the areas of nursing and health care administration. Applicants musts be admitted to and satisfy requirements for both programs.

Additional Admission Requirements

In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in the MSN/MHA program:

1) BSN degree from an NLN accredited program with an overall GPA of at least 3.0 (on a 4.0 scale) on all previous work beyond high school.
2) Current unencumbered licensure as a Registered Nurse in North Carolina.
3) Satisfactory performance on the Graduate Record Exam (GRE), Miller's Analogies Test (MAT), or the Graduate Management Admission Test (GMAT). (Not required for applicants who hold another graduate degree; e.g. M.B.A., M.S.W., M.D.)
4) Prerequisite course in introductory statistics with a grade of C or better.
5) Essay describing the applicant's experience and objective in undertaking graduate study

6) Basic computer skills including the use of word processing, spread sheet and data base software.
7) A course in basic accounting is a prerequisite for Accounting for Health Care Management, but does not have to be completed before admission.

Degree Requirements

The MSN/MHA degree requires 51 credit hours of courses offered through the Colleges of Nursing and Health Professions, Arts and Sciences, and Business Administration. Additionally each student will complete a 144-hour practicum experience in nursing administration:

Required Courses for Nursing and Health Administration (30 hours)

RSCH 6110 Inferential Statistics (3)
NURS 6101 Theoretical Basis for Nursing Practice (3)
NURS 6160 Research in Nursing and the Health Professions (3)
NURS 6152 Information Resource Management (3)
NUCN 6201 Advanced Nursing Care in the Community (3)
NUNA 6175 Theory and Application of Administration to Nursing Systems (3)
NUNA 6490 Advanced Practicum in Nursing Administration (3)
HLED6189 Community Epidemiology (3)
NURS 6115 Health Policy and Planning in the U.S. (3) *or*
HADM 6112 Introduction to the U.S. Health Care System (3)
Guided Elective (3)

Required Courses for Health Administration (21 hours)

HADM 6114 Economics of Health Policy (3)
HADM 6123 Accounting for Health Care Management (3)
HADM 6125 Finance in Health Care Administration (3)
HADM 6130 Health Law and Ethics (3)
HADM 6145 Organization Theory and Leadership (3)
HADM 6147 Human Resource Management (3)
HADM 6166 Strategic Management of Health Services Organizations (3)

Assistantships

Graduate Assistantships available for master's degree students are limited in number. For information on graduate assistantships and other financial aid, please contact the Office of Student Services, College of Nursing & Health Professions, UNC Charlotte, 9201 University City Blvd. Charlotte, NC 28223-0001, (704) 547-4684.

Practica

NUNA 6490 Advanced Practicum in Nursing Administration (3)

Capstone Experiences

NUNA 6490 Advanced Practicum in Nursing Administration (3)

Advising

Faculty advising is required each semester.

Licensure

Current unencumbered licensure as a registered Nursing in North Carolina

Research Opportunities/Experiences

Student who choose to do so will have the opportunity to serve as Research Assistants on faculty research projects.

Financial Assistance

For information on financial aid, please contact the Office of Student Services, College of Nursing & Health Professions, UNC Charlotte, 9201 University City Blvd. Charlotte, NC 28223-0001, (704) 547-4684.

Program Certifications/Accreditations

The overall MSN Program is accredited by the NLN and CCNE. Graduate of the program will be eligible to take the American Nurses Credentialing Center (ANCC) examination for Nurse Administration, Advanced.

Courses in Nursing

NURS 5090. Selected Topics in Nursing. (1-3) Prerequisite: permission of instructor. Topics to be chosen from the specialties of nursing. May be repeated for credit as topics vary. No more than six hours of topics and/or independent study course credit in nursing may be applied toward degree requirements. *(Fall, Spring)*

NUCI 6100. Chronic Illness Concepts and Theories for Advanced Nursing Practice. (3) Pre or Co-requisite: NURS 6101 and 6160. Focus on contemporary chronic illness concepts and theories relevant to individuals and families coping with long-term health deviations and their impact on society. Emphasis on knowledge and skills needed for advanced nursing practice. *(Fall)*

NURS 6101. Theoretical Basis for Nursing Practice. (3) Philosophical foundations and knowledge development in nursing. Evaluation of theories, models, and their relationships to practice. *(Fall, Spring)(Every other summer)*

NURS 6105. Roles and Issues in Advanced Practice Registered Nursing. (2) Examine issues affecting the emerging role of the advanced practice registered nurse. Designed to facilitate the role development of nurses who plan to practice within a specific clinical area of advanced nursing practice. Core concepts include subroles of advanced nursing practice, standards of practice, legal and

professional issues affecting the Advanced Practice Nurse. Examination and discussion of current practice issues will provide a framework that will enable the student to assume the role of advanced practice registered nurse in the changing health care environment.

NUCI 6106. Health Care Management of Adults I. (3) Prerequisites: BIOL 6050. Special Topics in Physiology (Pathophysiology), NURS 6230 and 6220. Co-requisite: NUCI 6100. Designed to provide students with the opportunity to integrate knowledge from advanced assessment, Pathophysiology, pharmacotherapeutics, theory and research to provide the advanced practice nurse with the requisite skills in the management of acutely ill adults with chronic illness in a variety of settings. Emphasis is placed on the use of diagnostic reasoning skills in the diagnosis pharmacological, and non pharmocological management of acutely ill adults with chronic illness. Application of models and theories to guide advanced nursing practice and planned research based care of adult with chronic illness is expected.*(Fall)*

NUCI 6107. Health Care Management of Adults II. (3) Prerequisite : NUCI 6106. Builds on knowledge of advanced assessment, Pathophysiology, pharmacotherapeutic, and theory and research to provide the advance practice nurse with the framework to manage adults with chronic illness in the ambulatory setting. Emphasis is placed on a wellness focus in the care of adults throughout the life span with common reoccurring acute illnesses and stable chronic conditions. Models of health promotion, disease prevention, health education and wellness will be used to guide the advanced practice nurse in assessing, diagnosing and planning care for adults. The case study approach will be used as a framework to implement the diagnostic reasoning and clinical decision making process. (Spring)

NURS 6115. Health Policy and Planning in the U.S. (3) Overview of health care delivery system in the United States. Analysis of health care policy, financing, political trends, ethical, and professional issues, including the theoretical underpinning of policy making, the empirical thrusts of policy analysis and research, and the relationship between policy making and the political process. *(Fall, Spring)*

NUMH 6130. Advanced Psychiatric Mental Health Nursing Practice with Individuals. (4) Prerequisites: NUMH 6300. Examination and application of the therapeutic process of advanced psychiatric mental health nursing in selected clinical experiences. Clinical seminar, clinical conference, clinical experience, and faculty/peer supervision provide opportunities for development of the roles of the advanced psychiatric mental health nurse in a managed care or traditional health care environment as an individual therapist. *(Spring)*

NUMH 6135. Advanced Psychiatric Mental Health Nursing Practice with Groups and Communities. (4) Prerequisite: NURS 6130. Corequisite: NURS 6201. Examination and application of the therapeutic process of advanced psychiatric mental health nursing with emphasis on groups and communities. Clinical seminar, clinical experience and supervision provide opportunities for development of the roles of the nurse in a managed care and traditional health care environment as a group therapist and promotion of mental health in community settings. *(Fall)*

NUAN 6151. Principles of Nurse Anesthesia I. (3) Prerequisite: NURS 6156. Overview of the principles, techniques and equipment necessary for the administration of anesthesia for the general surgical client. *(Spring, Summer)*

NUAN 6152. Principles of Anesthesia II. (3) Prerequisite: NURS 6151. Specific techniques of nurse anesthesia practice for selected clients. *(Summer)*

NUAN 6153. Principles of Anesthesia III. (3) Prerequisite: NURS 6152. Advanced nurse anesthesia practice for selected clients. *(Fall)*

NUAN 6154. Pharmacology in Nurse Anesthesia I. (4) Prerequisite: Consent of the Department. Introduction to the pharmacology of anesthetic drugs and adjunctive agents, including general pharmacological principles, pharmacokinetics and pharmacodynamics. *(Fall)*

NUAN 6155. Pharmacology in Nurse Anesthesia II. (4) Prerequisite: NURS 6154. Continuation of Pharmacology I with emphasis on the clinical use of anesthetic agents and adjunctive drugs. *(Spring)*

NUAN 6156. Applied Physics and Chemistry in Nurse Anesthesia. (3) Prerequisite: Consent of the Department. Basic laws and principles of physics, inorganic chemistry, and organic chemistry as they apply to the clinical practice of nurse anesthesia. *(Fall)*

NUAN 6157. Applied Pathophysiology in Nurse Anesthesia I. (3) Prerequisite: BIOL 6050. Pathophysiology of the nervous and cardiovascular systems with emphasis on their anesthetic implications. *(Spring)*

NUAN 6158. Applied Pathophysiology in Nurse Anesthesia II. (3) Prerequisite: NURS 6157. Pathophysiology of the respiratory, endocrine, excretory and renal systems with emphasis on their anesthetic implications. *(Summer)*

NUAN 6159. Professional Aspects of Nurse Anesthesia. (1) Prerequisite: NUAN 6153. Overview of the legal aspects regarding the practice of nurse anesthesia and information about the American Association of

Nurse Anesthetists, including its history and the Councils on Accreditation, Licensure and Practice. *(Spring)*

NURS 6160. Research in Nursing and the Health Professions. (3) Prerequisites: Nursing majors: NURS 6101; Health Education majors; HPKD 6143. Application of inquiry methods to problems in nursing and the health professions. *(Fall, Spring)*

NURS 6175. Nursing Informatics. (3) Adaptation of technological innovation (Informatics) to the field of nursing, including theoretical and applied computer utilization. Emphasis on learning to use new nursing technologies and to build upon their present patient care capabilities. *(Fall)*

NUNA 6175. Theory and Application of Administration to Nursing Systems. (3) Prerequisites: NURS 6101, NUR 6160. This course is designed to examine critical nursing management issues, and selected theoretical frameworks that serve to synthesize the disciplines of nursing and management. A systems approach provides the central framework for the study of nurse staffing, utilization, patient acuity and quality assurance components to the professional practice of nursing.

NURS 6176. Nursing Data. (3) Prerequisite: NURS 6175. Data-information - knowledge continuum in nursing and its application to practice, emphasizing identification, systemization and use of nursing data for decision support and expert judgment. *(Spring)*

NUMH 6200. Psychiatric Mental Health Theories and Constructs of Mental Health Care. (3) Prerequisite or Corequisite: NURS 6101. Examination of theoretical frameworks underlying the practice of advanced psychiatric mental health nursing. Integration of biological, psychological, sociological, and nursing theories into the student's individual theoretical framework for practice. *(Fall)(Alternate years)*

NUCN 6201. Advanced Nursing Care in the Community. (3) Pre-or corequisite: Epidemiology or consent of instructor. Advanced nursing in the community emphasizing community assessment, needs assessment, cultural diversity, community organization and dynamics, change theory, motivation theory, community focused change and issues related to community based nursing. *(Spring)*

NUCN 6202. Organization and Delivery of Health Care in Urban and Rural Environments. (3) Prerequisite: NUCN 6201 or consent of instructor. Working with communities to plan, implement and evaluate health programs in urban and rural settings, including use of focus, advisory and community action groups. *(Fall)*

NUCN 6203. Assessing Risk in Populations. (3) Prerequisite: NUCN 6201 or consent of instructor. Risk assessment and the implementation and evaluation of primary prevention services to populations at risk, including prevention strategies and the effects of social and political influences on program development. *(Spring)*

NUCN 6204. Synthesis in Community Health Nursing. (3) Pre or corequisites: Completion of NUCN 6201 and NUCN 6202 and taken within the last 9 hours of program requirements. Required of all community health nursing majors. Provides opportunities for application of problem-solving processes and methods of population-based practice to promote, maintain, and restore health and quality of life in communities and populations. Student designed syntheses of principles of community practice, program planning and evaluation, behavior change, relevant theory, and environmental contexts are critically evaluated through complex case study analyses and projects. *(Fall)*

NURS 6210. The Family and Health: Concepts, Theories, and Research. (3) Prerequisite or corequisite: NURS 6101. Family as the basic unit of care and analysis of the cultural context of families. Theories, concepts, and research for the comprehensive assessment and management of family health throughout the family life cycle. *(Spring)*

NURS 6220. Pharmacotherapeutics in Advanced Nursing Practice. (3) Prerequisite or corequisite: BIOL 6050 Advanced Human Physiology. Principles of pharmacology and drug therapy for advanced nursing practice, including legal and social considerations related to prescriptive authority and prescribing patterns. Satisfies NC Board of Nursing requirements for nurse practitioner. *(Spring)*

NURS 6230. Health Assessment and Diagnostic Reasoning for Advanced Nursing Practice. (3) Prerequisite or corequisite: NURS 6101 and BIOL 6050 Advanced Human Physiology. Knowledge and skills for advanced physical and psychosocial health assessment of adults and children. Advanced health evaluation techniques, laboratory tests, diagnostic studies and interpretation and documentation of findings. Includes two credit hours of didactic and one credit hour of clinical practice. *(Fall)*

NUNP 6240. Advanced Primary Care of Women. (5) Prerequisite: NURS 6220, 6230; and NUNP 6250. Prerequisite or corequisite: NURS 6210. Role of the family nurse practitioner in the primary care of women and preparation for advanced clinical decision making related to common health concerns of women. Concepts of health promotion, health maintenance, and cultural and environmental variations are integrated throughout the course. Includes three credit hours of didactic and two credit hours of clinical practice (120 clinical hours). *(Spring)*

NUNP 6250. Advanced Primary Care of Adults. (5) Prerequisites: NURS 6220, 6230, and 6210. Role of the family nurse practitioner in the primary care of adult family members and preparation for advanced clinical decision making related to adults with common health problems, including acute episodic illness and stable chronic disease. Concepts of health promotion, health maintenance, and cultural and environmental variations are integrated throughout the course. Includes 3 credit hours of didactic and two credit hours of clinical practice (120 clinical hours). *(Fall)*

NUNP 6260. Advanced Primary Care of Children and Adolescents. (5) Prerequisites: NURS 6220, 6230; and NUNP 6250. Prerequisite or corequisite: NURS 6210. Role of the family nurse practitioner in the primary care of children and adolescents and preparation for advanced clinical decision making related to children and adolescents with common health problems including acute episodic illness and stable chronic disease. Concepts of health promotion, health and cultural and environmental variations are integrated throughout the course. Includes 3 credit hours of didactic and 2 credit hours of clinical practice (120 hours). *(Spring)*

NUNP 6400. Internship in Family Health Nursing. (4) Prerequisite: NUNP 6240, 6250, and 6260. Role of the family nurse practitioner in the assessment and management of the health of individuals and families across the lifespan. Implementation of clinical decision making skills in family health promotion and management of acute episodic and stable chronic conditions and consideration of professional practice issues. Includes one credit hour of seminar/case presentation and three credit hours of clinical practice (240 clinical hours). *(Summer)*

NUCI 6401. Advanced Practice Nursing in Ambulatory Care. (4) Prerequisite: NUCI 6106. Co-requisite: NUCI 6107. Emphasis on the role of the advanced practice nurse in promoting health life-styles to prevent or minimize the effects of chronic illness. Students will incorporate critical thinking and diagnostic reasoning in assessing, diagnosing, monitoring, coordinating, managing outcomes and communicating health care findings of adults and their families in ambulatory care settings. (240 clinical hours and scheduled clinical seminar) *(Spring)*

NUMH 6401. Internship in Advanced Psychiatric Mental Health Nursing Practice. (4) Prerequisite: NUMH 6135. Corequisite: NURS 6115. Role of the advanced practice psychiatric mental health nurse in the assessment and management of individuals, groups, and communities; application of clinical decision making skills in individual and group psychotherapy and in a community mental health setting; examination of professional practice issues. Seminar/case presentation and 120 hours of clinical practice. *(Spring)*

NUCI 6402. Advanced Practice Nursing in Acute Care. (4) Prerequisite: NUCI 6107. Focuses on the care of adults who have acute episodes of illness and require care in acute care settings. Emphasis is placed on alterations in oxygenation, metabolism, mobility, and immunity experienced by acutely ill adults. Students will incorporate critical thinking and diagnostic reasoning, in assessing, diagnosing, monitoring, coordinating, managing outcomes and communicating health care findings of adults. (240 clinical hours and scheduled clinical seminar) *(Fall)*

NUCI 6403. Advanced Practice Nursing in Chronic Care. (4) Pre or Co-requisite: NUCI 6107. Focus is on outcome management of chronically ill clients with multi-system problems. Emphasis on the role of the advanced practice nurse in helping chronically ill adults and their families manage the effects of and achieve optimum outcomes in chronic illness. (240 clinical hours and scheduled clinical seminar). *(Spring)*

NUCN 6405. Community Health Nursing Internship I. (3) Prerequisite: NUCN 6201; pre- or corequisite: NUCN 6202. Assessment of health need in a specific urban or rural public health setting in the metropolitan area, including identification of intervention choices and community resources and development and implementation of action and evaluation plans with emphasis on program financing. Ten hours of practice per week and a two hour weekly seminar. *(Fall, Spring)*

NUCN 6406. Community Health Nursing Internship II. (3) Prerequisite: NUCN 6205, pre- or corequisite NUCN 6203. Identification of high risk populations in the metropolitan area and intervention choices and community resources to serve them, including development and implementation of action and evaluation plans. Ten hours of practice in the community per week and a two hour weekly seminar. *(Fall, Spring)*

NUAN 6485. Clinical Residency in Nurse Anesthesia I. (5) Prerequisites: NUAN 6153. Clinical application of didactic material from the nurse anesthesia curriculum through beginning level practice in the role of a nurse anesthetist. Conferences during the clinical residency provide opportunities to review current research and practice issues. *Pass/Unsatisfactory* grading only. *(Fall, Spring)*

NUAN 6486. Clinical Residency in Nurse Anesthesia II. (5) Prerequisite: NUAN 6485. Continuation of the clinical application of didactic material from the nurse anesthesia curriculum with focus on utilization of additional anesthesia techniques and increased skill development. *Pass/Unsatisfactory* grading only. *(Spring, Summer)*

NUAN 6487. Clinical Residency in Nurse Anesthesia III. (5) Prerequisite: NUAN 6486. Incorporation of the content of the nurse anesthesia curriculum with

opportunities to begin synthesis of all didactic material and techniques for efficient clinical practice. *(Fall, Summer)*

NUAN 6489. Clinical Residency in Nurse Anesthesia IV. (5) Prerequisite: NUAN 6487. Non-credit clinical residency for synthesis of all didactic material and techniques of nurse anesthesia clinical practice, promotion of professional practice, and preparation of the student for the licensure examination. *(Fall, Spring)*

NUNA 6490. Advanced Practicum in Nursing Administration. (3) Prerequisites: All courses in the dual MSN/MHA. This practicum provides a guided experience in any agency or agencies appropriate for the students selected concentration area. Designed as a capstone course of the dual master's program in Nursing Service Administration and Health Administration. Students are expected to demonstrate theory and practice under the supervision of selected administrative preceptors. *(Spring, every other year)*

NUCI 6601. Synthesis in Advanced Practice Nursing of Chronically III Adults. (3) Co-requisite: NUCI 6406. Emphasis is on synthesizing theory, research, and practice to promote maintain, and restore health and quality of life in adults with chronic illness in the blended role of the Advanced Practice Nurse. Preparation to assume the role of the advanced practice nurse will include the development of resume, job description, and marketing techniques. This course will culminate in a capstone experience that integrates research, theory and practice. *(Spring)*

NURS 6661. Research Seminar. (2) Prerequisite: NURS 6160 and graduate statistics course. Application of inquiry methods to nursing problems including systematic observation and critical analysis of research methods. Submission of a written research or project proposal is required. *(On demand)*

NURS 6895. Independent Study. (1-3) Guided individual study in topics or issues related to nursing arranged with a faculty adviser. May be repeated for credit. No more than six hours of topics and/or independent study courses may be counted toward degree requirements. *(Fall, Spring)*

NURS 6962. Thesis. (1-3) Prerequisite: NURS 6160. Production of a piece of nursing research or investigation of a problem relevant to nursing which demonstrates contribution to professional knowledge through systematic investigation and participation in the process of peer reviewed research. *(Fall, Spring)*

NURS 7999. Graduate Residence. (0) Prerequisite: Consent of thesis adviser. Required of all graduate studies working on a thesis who are not enrolled in other graduate courses. *(Fall, Spring)*

OPERATIONS RESEARCH

Degree

Interdisciplinary Graduate Minor

Department of Mathematics

376 Fretwell Building
(704) 547- 2580

The interdisciplinary graduate minor in Operations Research is designed to provide advanced problem solving skills and knowledge in the general areas of operations research and optimization to enable their application to effectively address the present-day problems of business, management science, engineering and computer science. This program prepares students for studies leading to the Ph.D. degree. The required courses are offered by the participating departments of Electrical Engineering, Civil Engineering, Computer Science, Mechanical Engineering, Economics, and Information&Operations Management.

Admission Requirements

Students admitted to graduate degree programs in the participating departments and the M.B.A. program who are in good standing, are eligible for the minor in Operations Research.

Requirements for the Minor

1) Declaration of the minor, preferably by the end of the first semester of graduate study.
2) Formation of a Program Committee: Students who elect to minor in Operations Research will select a participating faculty member as a member of their regular graduate committee. A list of participating faculty will be available from the coordinator of the minor in Operations Research.
3) Fulfill the requirements of a participative degree program and complete OPRS 6101/8101 and one course each from two of the following areas selected with the advice and knowledge of the student's program committee.

Mathematics: OPRS 5111, 5112, 5113, 5114 MATH 5165, 7125, 7177 and topics: reliability theory, queuing models, variational methods.
Computer Science: CSCI 5131, 5150, 6160, 6166
Management Information Systems and Operations Management: MBAD 6121, 6122, 6141
Economics: ECON 4100, 4112
Electrical Engineering: EEGR 6111, 6112, 6115, 6116
Civil Engineering: CEGR 5090, 6181

Students must have a cumulative 3.0 GPA in courses applied to the minor. Course waivers and transfer credit will be considered on an individual basis.

Courses in Operations Research

OPRS 5010. Topics in Decision Mathematics. (2-3) Prerequisite: consent of the department. Topics in decision mathematics selected to supplement regular course offerings in this area of mathematics. May be repeated for additional credit with the approval of the department. Credit for the M.A. degree in mathematics requires approval of the department. *(On demand)*

OPRS 5111. Linear Programming. (3) Prerequisite: OPRS 3111 and CSCI 1100 or 1201 and 1201L. Mathematical formulation and solution of linear programming problems. Topics include: the simplex method and its variations, sensitivity and parametric analysis, duality, and applications. A project will be required for all graduate students. *(On demand)*

OPRS 5112. Non-Linear Programming. (3) Prerequisites: CSCI 1100 or 1201 and 1201L, OPRS 3111 and MATH 2241. Basic unconstrained optimization problems, search techniques, some discussion of rates of convergence and an introduction to constrained optimization. Computer implementation and testing of optimization algorithms will be required. A project will be required of all graduate students. *(On demand)*

OPRS 5113. Game Theory. (3) Prerequisites: OPRS 3111 and one of STAT 2122, MATH/STAT 3122, or OPRS 3113. The theory of zero-sum matrix games, minimax theorem, optimal strategies, symmetric games, economic models, infinite, separable, polynomial, multistage, general-sum and n-person games. A project will be required of all graduate students. *(On demand)*

OPRS 5114. Dynamic Programming. (3) Prerequisites: CSCI 1100 or 1201 and its lab, OPRS 3111, and one of STAT 2122, MATH/STAT 3122 or OPRS 3113. The identification of dynamic programming problems and their solution in terms of recurrence relations. Elementary path problems, resource allocation, shortest path, traveling salesmen problem, discrete-time optimal control, replacement models and inventory systems. A project will be required of all graduate students. *(On demand)*

OPRS 6101. Introduction to Operations Research. (3) Prerequisite: STAT 3122. Operations Research approach: modeling, constraints, objective and criterion. The problem of multiple criteria, optimization, model validation. The team approach. Systems design. Examples, or methodology: mathematical programming, optimum seeking, simulation, gaming, heuristic programming. Examples, or applications: theory of inventory, economic ordering under deterministic and stochastic demand. The production smoothing problem, linear and quadratic cost functions. Waiting line problems: single and multiple servers with Poisson input and output. The theory of games for two-person competitive situations. Project management through probabilistic activity networks and deterministic activity network (CPM-PERT). *(Fall)*

OPRS 7125. Stochastic Processes. (3) Same as MATH 7125.

OPRS 8101. Introduction to Operations Research. (3) See description for OPRS 6101.

OPRS 8125. Stochastic Processes. (3) Same as MATH 7125.

PHYSICS

Department of Physics
101 Burson Building
(704) 547- 2537
http://www.physics.uncc.edu

Degrees
M.S. (Applied Physics), Ph.D. (Interdisciplinary, ECE, ME, IT, Math and Biology)

Coordinator
Dr. M. Yasin Akhtar Raja

The Master of Science program in Applied Physics offers both thesis and non-thesis degree options. While students have opportunities for research in several areas, the research emphasis of faculty in the department is in the area of applied optics. Primary areas of research include: optoelectronic devices and systems, optical sensors, near-field optics, fiber optics, laser spectroscopy, and biomedical optics. A description of research in these and other areas can by obtained by viewing our home page at http://www.physics.uncc.edu.

Additional Admission Requirements
In addition to fulfilling the university's general requirements for graduate admission at the Master's level, applicants seeking admission into the physics graduate program must also:

1) Possess a Bachelor's degree in Physics, or a closely allied field, usually from an accredited college or university. Applicants from fields other than Physics may expect to be required to remove deficiencies in their physics background.
2) Present satisfactory scores on the aptitude portion of the Graduate Record Examination.
3) Possess an overall grade point average of at least 2.75 (based on a 4.0 scale) on all of the applicant's previous work beyond high school. The average in the major should be 3.0 or better.

4) Present satisfactory scores on the Test of English as a Foreign Language, if the applicant is from a non-English speaking country.
5) Demonstrate evidence of sufficient interest, ability, and preparation in physics to adequately profit from graduate study, as determined by the Physics Department's Graduate Committee.

Admission to Candidacy

In addition to the general requirements for admission to candidacy, students enrolled in the Master of Science program in Applied Physics program should have:

1) Removed all identified entrance deficiencies by the time of application for admission to candidacy,
2) Completed at least 18 approved credit hours with a GPA of 3.0 or better, and
3) Passed the qualifying examination administered by the student's advisory committee. Normally, the qualifying examination for a student selecting the thesis option will be based on a literature search related to the thesis topic.

Degree Requirements

The Master of Science degree in Applied Physics requires the completion of 30 hours of coursework approved by the Physics Department and may include up to 12 semester hours from such related areas as Mathematics, Chemistry, and Engineering. Entering students not having the equivalent of PHYS 4222, PHYS 4232, PHYS 4242 are required to take PHYS 5222, PHYS 5232, or PHYS 5242 and must complete a minimum of 15 semester hours in physics courses numbered 6000 and above. Courses for which undergraduate credit has been awarded may not be repeated for graduate credit. A student selecting the thesis option must present credit for at least 6 semester hours of PHYS 6991.

A minimum grade point average of 3.0 is required on all coursework attempted for the degree. At the time of admission up to 6 semester hours of graduate transfer credit may be accepted if approved by the Physics Department and the Graduate School.

Comprehensive Examination

All candidates for the degree must pass a final examination. The thesis defense is the final examination for a student selecting the thesis option.

Assistantships

Support for beginning graduate students is usually a teaching assistantship. Continuing students are often supported by research assistantships.

INTERDISCIPLINARY Ph.D. OPTIONS

The Physics Department, in conjunction with the Departments of Electrical and Computer Engineering, Mechanical Engineering, Biology, and the College of Information Technology offers an opportunity for students who have completed the program leading to the Master of Science in Applied Physics to continue graduate studies leading to a Ph.D. in those areas of applied optics that relate to optoelectronics, microelectronics, precision engineering, materials engineering, biomedical optics, optical communications, and optical networks. Students choosing to work in optoelectronics or microelectronics would receive the Ph.D. through the Electrical Engineering Department; those working in precision engineering or materials engineering would receive a Ph.D. in Mechanical Engineering. Students enrolled in biomedical optics would receive a Ph.D. through the Department of Biology, while students with research in the optical communication area would receive a Ph.D. through related departments in the College of Information Technology. Students selecting this option would pursue a course of study that includes work in the Physics Department and one of the related departments. A description of opportunities in this area can by obtained by viewing our home page or by contacting the Graduate Coordinator for the Physics Graduate Program.

COURSES IN PHYSICS

PHYS 5000. Selected Topics in Physics. (0-4) Prerequisite: consent of department. Selected advanced topics in physics. May be repeated with approval of the department. *(On demand)*

PHYS 5210. Theoretical Physics. (3) Prerequisite: consent of department. Topics include: Matrices, power series, solutions to ordinary and partial differential equations, Hilbert space, Fourier integrals, boundary value problems, Green's functions, and complex analysis. *(Fall)*

PHYS 5222. Classical Mechanics II. (3) Prerequisite: PHYS 3121, MATH 2241. *(Spring)*

PHYS 5231. Electromagnetic Theory I. (3) Prerequisites: For physics majors, PHYS 3121 with a grade of C or better; Others: consent of the instructor; MATH 2171, MATH 2241. Corequisite: MATH 2242. *(Spring)*

PHYS 5232. Electromagnetic Theory II. (3) Prerequisites: PHYS 4231 with a grade of C or better. *(Fall)*

PHYS 5242. Modern Physics II. (3) Prerequisite: PHYS 4241. A continuation of PHYS 4241. *(Spring)*

PHYS 5271. Waves and Optics. (3) Prerequisites: PHYS 2102 with a grade of C or better, senior standing, and MATH 2171. Exceptions by consent of the instructor. Topics include the mathematics of wave motion, light as an example of an electromagnetic wave,

the superposition of periodic and non-periodic waves, and selected topics from geometrical and physical optics. *(Fall)*

PHYS 6101. Biophysics. (3) Prerequisite: Consent of instructor. Will include principles of physics relevant to biological media; electrical activity, optical microscopy, and spectrophotometry. Photosynthesis and light absorption. Models of blood flow and the cardiovascular system. Dynamics of membrane lipids and ionic flow. Visual and audio systems. Radiation biophysics, ultrasonic interaction in biological media. Credit cannot be awarded for both PHYS 6101 and 8101. *(Fall)*

PHYS 6121. Classical Dynamics. (3) Prerequisite: PHYS 4222. Variational principles and Lagrange's equations. Hamilton's principles and mechanics of particles. The two body central force problem. Rigid body motion. Small oscillations and the eigenvalue equation. *(Spring) (Alternate years)*

PHYS 6131. Classical Electromagnetism I. (3) Prerequisite: PHYS 4232. Electrostatic and boundary value problems. Multipole expansions, dielectrics and magnetostatics. Maxwell's equations, time-varying fields and conservation laws. Plane electromagnetic waves and wave propagation. Wave guides and resonant cavities. Simple radiating systems. Scattering and diffraction theory. *(Fall) (Alternate years)*

PHYS 6132. Classical Electromagnetism II. (3) Prerequisite: PHYS 6131. Special theory of relativity. Dynamics of relativistic particles and electromagnetic fields. Charged particle collisions and scattering. Radiation by moving charges. Bremsstrahlung, virtual quanta, and beta decay theory. Multipole expansion and fields. Radiation damping. Self fields of particles. Scattering and absorption of radiation by a bound system. *(On demand)*

PHYS 6141. Quantum Theory I. (3) Prerequisite: PHYS 4242. Non-relativistic wave mechanics. The Schrodinger equation, linear harmonic oscillator and WKB approximation. Central forces and angular momentum. The hydrogen atom. *(Fall) (Alternate years)*

PHYS 6142. Quantum Theory II. (3) Prerequisite: PHYS 6141. Scattering theory, linear vector spaces, spin, two level systems. Quantum dynamics, symmetry operations, bound state and time-dependent perturbation theory. Theory of scattering, angular momentum, and identical particles. *(On demand)*

PHYS 6201. Fourier Optics and Holography. (3) Prerequisite: PHYS 4271 or consent of department. Principles of scalar, Fresnel, and Fraunhofer diffraction theory. Coherent optical imaging systems, optical filtering, optical data processing, and holography. Application of Fourier optics and holography. *(Fall)*

PHYS 6211. Quantum Electro-Optics. (3) Prerequisite: PHYS 4271 or consent of department. Theory of laser oscillation, optical resonators, interaction of radiation and atomic systems, giant pulsed lasers, laser systems. Wave propogation in non-linear media, modulation of optical radiation, noise in optical detection and generation. Interaction of light and sound. Laser types and applications including the free-electron laser. *(Spring)*

PHYS 6220. Computational Methods in Physics. (3) Prerequisite: consent of department. Use of computers in solving physics problems including computational and mathematical methods to solve problems in classical mechanics, quantum mechanics, electromagnetism, nuclear physics, optics, and solid state physics. Computer solutions include numerical methods of integration, solving differential equations, curve fitting, and statistical analysis in physics. *(On demand)*

PHYS 6221. Optical Communications. (3) Prerequisite: PHYS 5211 or PHYS 6211 or ECGR 5125 or ECGR 5165 or consent of instructor. Introduction to optical communications and basic communication blocks. Coherent and incoherent detection signal processing, photonic switching and point-to-point connections. Networking (optical-layer), multiplexing and de-multiplexing. Time-domain medium access (TDMA) e.g., SONET, wavelength-division multiplexing (WDM and MONET). Subscriber multiplexing, optical clock, timing recovery and line coding. Optical amplification, broadband ISDN concepts, optical LAN and WAN topologies. (Cross listed as ECGR 6221). *(On demand)*

PHYS 6241. Fundamentals of Modern Optics. (3) Prerequisite: PHYS 4241 or consent of department. Wave nature of light, basic semiconductor properties, light sources, light detectors and modulators, optical waveguides, optical systems with applications, and selected topics in non-linear optics. *(Fall)*

PHYS 6251. Statistical Physics. (3) Prerequisite: PHYS 3151 or consent of department. Classical and quantum statistical mechanics. Statistical thermodynamics. Ensembles, partition functions, fluctuations, ideal Fermi and Bose gas systems. *(On demand)*

PHYS 6261. Nuclear and Particle Physics. (3) Prerequisite: PHYS 4140 or consent of department. Properties of nuclei, nuclear models, and interactions. Nuclear reactions, fission, and fusion. Alpha, beta, and gamma decay. One and two particle states. Relativistic kinematics, principle of invariance, quantum numbers, elementary particles and models. *(On demand)*

PHYS 6271. Advanced Solid State Physics. (3) Prerequisite: consent of department. Crystal structure. Electromagnetic, electron, mechanical, and elastic wave interactions with crystals. Theory of X-ray diffraction.

Energy band theory of metals and semiconductors. Optical properties of solids, phase transitions, and amorphous solids. Quantum mechanics of covalent bonding, phonon excitation, and thermal energy. *(Fall)*

PHYS 6281. Modern Optics Laboratory. (3) Prerequisite: consent of instructor. Selected experiments in such modern optics areas as fiber optics, holography, spectroscopy, and fourier optics. Six laboratory hours each week. *(Spring)*

PHYS 6991. Physics Thesis Research I. (1-3) Prerequisite: admission to candidacy and consent of department. Research for the thesis. May be repeated to accumulate a maximum of 6 hours credit. *(Fall, Spring, Summer)*

PHYS 6992. Physics Thesis Research II. (1-4) Prerequisite: PHYS 6991 and consent of department. Research for the thesis. Graded pass/fail. May be repeated to accumulate a maximum of 4 hours credit. *(Fall, Spring, Summer)*

PHYS 7999. Graduate Residence. (1) Required of all masters students working on or defending thesis projects and/or are scheduled for comprehensive examinations who are not enrolled in other graduate courses. Credit for this course may not be used to satisfy the 30 semester-hour requirement for the degree. May be repeated for credit. *(Fall, Spring, Summer)*

PHYS 8101. Biophysics. (3) Prerequisite: Enrollment in the Biology Ph.D. program, or consent of the instructor. Will include principles of physics relevant to biological media; electrical activity, optical microscopy, and spectrophotometry. Photosynthesis and light absorption. Models of blood flow and the cardiovascular system. Dynamics of membrane lipids and ionic flow. Visual and audio systems. Radiation biophysics, ultrasonic interaction in biological media. Credit not awarded for both PHYS 6101 and 8101. *(Fall)*

PHYS 8121. Classical Dynamics. (3) See PHYS 6121 for Course Description.

PHYS 8131. Classical Electromagnetism I. (3) See PHYS 6131 for Course Description.

PHYS 8132. Classical Electromagnetism II. (3) See PHYS 6132 for Course Description.

PHYS 8141. Quantum Theory I. (3) See PHYS 6141 for Course Description.

PHYS 8142. Quantum Theory II. (3) See PHYS 6142 for Course Description.

PHYS 8201. Fourier Optics and Holography. (3) See PHYS 6201 for Course Description.

PHYS 8211. Quantum Electro-Optics. (3) See PHYS 6211 for Course Description.

PHYS 8221. Optical Communications. (3) Prerequisite: PHYS 5211 or PHYS 6211 or ECGR 5125 or ECGR 5165 or consent of instructor. Introduction to optical communications and basic communication blocks. Coherent and incoherent detection signal processing, photonic switching and point-to-point connections. Networking (optical-layer), multiplexing and de-multiplexing. Time-domain medium access (TDMA) e.g., SONET, wavelength-division multiplexing (WDM and MONET). Subscriber multiplexing, optical clock, timing recovery and line coding. Optical amplification, broadband ISDN concepts, optical LAN and WAN topologies. (Cross listed as ECGR 6221). *(On demand)*

PHYS 8241. Fundamentals of Modern Optics. (3) See PHYS 6241 for Course Description.

PHYS 8251. Statistical Physics. (3) See PHYS 6251 for Course Description.

PHYS 8261. Nuclear and Particle Physics. (3) See PHYS 6261 for Course Description.

PHYS 8271. Advanced Solid State Physics. (3) See PHYS 6271 for Course Description.

PHYS 8999. Doctoral Degree Graduate Residence. (1-8) Contact the Department for more information.

PHYS 9999. Doctoral Residence. (1) Required of all doctoral students working on or defending their dissertation who are not enrolled in other graduate courses. Credit for this course may not be used to satisfy requirement for the degree. May be repeated for credit. *(Fall, Spring, Summer)*

PSYCHOLOGY

Department of Psychology

4018 Colvard Building
(704) 547-4731

Degree

M.A.

Coordinator

Dr. W. Scott Terry

Graduate Faculty

Clinical/Community Psychology
Lawrence G. Calhoun, Professor
James R. Cook, Associate professor
C. D. (Denny) Fernald, Associate Professor

Charles H. Kaplan, Associate Professor
Ryan Kilmer, Assistant Professor
Albert A. Maisto, Bonnie Cone Distinguished Professor
Richard D. McAnulty, Associate Professor
James W. Selby, Professor
Sam Simono, Professor
Richard Tedeschi, Professor

Industrial/Organizational
Kimberly K. Buch, Associate Professor
David C. Gilmore, Associate Professor
Jo Ann Lee, Associate Professor
William Siegfried, Associate Professor

Other members of the Graduate Faculty
Sarah D. Breedin, Assistant Professor
Arnie Cann, Professor
Paul W. Foos, Professor
Jane F. Gaultney, Associate Professor
Paula Goolkasian, Professor
Douglas L. Grimsley, Professor
Andrew Harver, Associate Professor
Susan K. Johnson, Assistant Professor
David Sohn, Associate Professor
Margaret Stanley-Hagan, Associate Professor
Debra F. Terrell, Assistant Professor
W. Scott Terry, Professor
Ignatius J. Toner, Professor
Lori Van Wallendael, Associate Professor
George Windholz, Ph.D., Emeritus Professor

PSYCHOLOGY CLINICAL/COMMUNITY

Master of Arts Degree

The objective of the master's degree program in Clinical/Community Psychology is to train psychologists in the knowledge and skills necessary to address problems encountered in modern living. The program provides a foundation in the research methods and content of basic psychology as well as training in the applied skills of professional practice. The relatively small, competitively selected student body receives individual attention from faculty members who maintain rigorous standards of academic excellence.

Students develop knowledge and skills in psychological assessment, learn various treatment and intervention strategies, and work with a variety of populations in consultation, evaluation, and research. An extensive practicum component utilizes the Charlotte area as a setting for applied experience.

The program prepares students for the North Carolina psychology licensure exam and for positions in diverse settings such as community mental health centers, correctional facilities, and other human service programs. A number of graduates have gone on to pursue a doctoral degree.

Additional Admission Requirements

To be considered for admission to graduate study in Clinical/Community Psychology, a student must present the following requirements in addition to those required by the Graduate School:
Completed application by March 1
18 hours of undergraduate psychology including Introductory Psychology & Research Methods
An undergraduate course in statistics
Acceptable scores on the Verbal and Quantitative GRE
Acceptable scores on the advance GRE test in psychology

Admission to the program is very competitive for the students entering the program each year. Most students who are admitted have much better records than the minimum required. The primary Clinical/Community Psychology application deadline is March 1 for admission in the fall semester, but if space is still available, late applications will be considered until May 1. Students may not begin the program during the spring semester.

Degree Requirements

The Clinical/Community Psychology program requires at least 48 semester hours of graduate coursework. Full-time students should be able to complete the program in two calendar years. A thesis and comprehensive exam are required.

Basic Knowledge and Methods in Psychology (14 hours)

PSYC 6102	Research Design and Quantitative Methods in Psychology (3)
PSYC 6107	Ethical and Professional Issues in Psychology (3)
PSYC 6999	Thesis (3)

and two courses (6 hours) selected from the following

PSYC 6010	Topics in Learning and Cognition (3)
PSYC 6015	Topics in Perception and Physiological Psychology (3)
PSYC 6020	Topics in Developmental Psychology (3)
PSYC 6030	Topics in Social Psychology and Personality (3)

Clinical/Community Coursework (34 hours)

PSYC 6050	Topics in Psychological Treatment (3)
PSYC 6141	Intellectual Assessment (4)
PSYC 6142	Personality Assessment (4)
PSYC 6145	Applied Research Design and Program Evaluation (3)
PSYC 6150	Psychological Treatment (4)
PSYC 6151	Behavior Disorders (4)
PSYC 6155	Community Psychology (3)
PSYC 6450	Practicum in Clinical Psychology (3)

PSYC 6455 Practicum in Community Psychology (3)
or
PSYC 6450 Practicum in Clinical Psychology (3)
Elective (Selected in consultation with adviser.) (3)

Hours beyond the 48 hours may be required by the academic adviser and the Clinical/Community Program Committee. The faculty conduct a thorough review of student performance on a regular basis. Continuation in the program is contingent upon a favorable review during these evaluations. Students who consistently show borderline course performance, who are not developing good applied skills in the practice of psychology, who fail to complete coursework in a timely basis, or who otherwise perform unprofessionally or unsatisfactorily, may be required to complete additional courses or practicum work, or may be removed from the program.

Comprehensive Examinations
All students are required to successfully complete comprehensive examinations covering research design, ethic and knowledge of clinical/community psychology. Students who fail the comprehensive exam twice are removed from the program.

Assistantships
A variety of resources are available for financial assistance. These include teaching assistantships for general psychology laboratory, research assistantships for faculty grants, and graduate assistantships in other campus units such as the Learning Center and Disability Student Services. These range in pay from $8,000 to $12,000 per academic year.

Research Experiences
Students are encouraged to become involved n ongoing research in the department, and they are required to complete a thesis.

Practica
Practica, involving practical experience working with human service agencies in the region, are a required part of the program.

PSYCHOLOGY INDUSTRIAL/ ORGANIZATIONAL
Master of Arts Degree

The objective of the master's degree program in Industrial/Organizational Psychology is to train psychologists in the knowledge and skills necessary to address problems encountered in work organizations. The program provides a foundation in the research methods and content of basic psychology as well as training in the applied skills of professional practice. Students in the Industrial/Organizational concentration develop knowledge and skills pertaining to people at work, including personnel selection and design and evaluation at work, including personnel selection and design and evaluation of programs, including programs for training employees, increasing performance, enhancing quality, reducing conflict and enhancing job satisfaction. The relatively small, competitively selected student body receives individual attention from faculty members who maintain rigorous standards of academic excellence.

Additional Admission Requirements
To be considered for admission to graduate study in Industrial/Organizational Psychology, a student must present the following requirements in addition to those required by the Graduate School:

1) Completed application by February 1
2) 18 hours of undergraduate psychology including Introductory Psychology & Research Methods
3) An undergraduate course in statistics
4) Acceptable scores on the Verbal and Quantitative GRE
5) Acceptable scores on the advance GRE test in psychology

These are minimum standards. Admission to the Industrial/Organizational program is very competitive for the spaces in the program available each year. The primary application **deadline is February** 1 for admission in the fall semester, but if space is available, late applications will be considered until May 1. Students may not begin the program during the spring semester.

Degree Requirements
The Industrial/Organizational program requires at least 48 semester hours of graduate coursework as specified below. Full-time students should be able to complete the program in two calendar years. The enrollment of a student who receives three grades of *C* or one *Unsatisfactory* grade during his or her graduate career is automatically terminated.

Basic Knowledge and Methods in Psychology (14 hours)

PSYC 6102 Research Design and Quantitative Methods in Psychology (3)
PSYC 6107 Ethical and Professional Issues in Psychology (3)
PSYC 6999 Thesis (3)

and two courses (6 hours) selected from the following:

PSYC 6010 Topics in Learning and Cognition (3)
PSYC 6015 Topics in Perception and Physiological Psychology (3)
PSYC 6020 Topics in Developmental Psychology (3)
PSYC 6030 Topics in Social Psychology and Personality (3)

Industrial/Organizational Psychology (22 hours)

PSYC 6140	Psychological Measurement and Evaluation (3)
PSYC 6171	Industrial/Organizational Psychology (3)
PSYC 6171L	Laboratory in I/O Psychology (1)
PSYC 6172	Personnel I (3)
PSYC 6174	Organizational Dynamics I (3)
PSYC 6175	Organizational Dynamics II (3)
PSYC 6177	Personnel II (3)
PSYC 6477	Projects in I/O Psychology (3)

Electives selected in consultation with Adviser (12 hours)

PSYC 6124	Psychology of Aging (3)
PSYC 6176	Counseling in Organizations (3)
PSYC 6899	Readings and Research (3)
	Graduate courses from other disciplines

The faculty conduct a thorough review of student performance on a regular basis. Continuation in the program is contingent upon a favorable review during these evaluations. Students who consistently show borderline course performance, who fail to complete coursework on a timely basis, or who otherwise perform unprofessionally or unsatisfactorily, may be required to complete additional courses or may be removed from the program.

Comprehensive Examinations

All students are required to successfully complete comprehensive examinations covering research design, ethics and information related to Industrial/Organizational Psychology. A student who fails the comprehensive exam twice will be removed from the program.

Assistantships and Other Financial Assistance

A variety of resources are available for financial assistance. These include teaching assistantships to proctor the general psychology laboratory, research assistantships to assist on faculty grants, and graduate assistantships in psychology and other campus units such as the Learning Assistance Center and the University Honors Office. These range from $8,000 to $12,000 per academic year. Information on loans, grants and employment opportunities is available from the Financial Aid Office.

Research Experiences

In addition to the completion of a thesis, students have the opportunity to work with individual faculty members on their research. The Department of Psychology has an energetic and dynamic faculty of more than 30 psychologists who are committed to education and have established an excellent record or productivity in all the major areas of psychological research and professional practice.

Practica

An extensive practicum component utilizes the Charlotte area as a setting for applied experience. All students must complete 3 hours of Projects in I/O Psychology (PSYC 6477) and they are strongly encouraged to take 6 hours.

Courses in Psychology

PSYC 6010 Topics in Learning and Cognition. (3) An examination of selected topics in the areas of learning, memory and cognition, and behavior modification, with an emphasis on the applications to the areas of clinical, community and industrial psychology. May be repeated for credit with the permission of department. *(Alternate years)*

PSYC 6015. Topics in Perception and Physiological Psychology. (3) An examination of selected topics in the areas of sensation and perception, physiological and neuropsychology, with an emphasis on the applications to the areas of clinical, community, and industrial psychology. May be repeated for credit with the permission of department. *(Alternate years)*

PSYC 6020. Topics in Developmental Psychology. (3) An examination of selected topics in child and adult development, aging, and developmental disabilities, with an emphasis on the applications to the areas of clinical, community, and industrial psychology. May be repeated for credit with the permission of department. *(Alternate years)*

PSYC 6030. Topics in Social Psychology and Personality. (3) An examination of selected topics in personality and social psychology, with an emphasis on the applications to the areas of clinical, community, and industrial psychology. May be repeated for credit with the permission of department. *(Alternate years)*

PSYC 6050. Topics in Psychological Treatment. (3) Prerequisite: PSYC 6151. A topical course which will focus on issues in treatment, alternative treatment perspectives, special client populations. May be repeated for credit with departmental permission. *(Yearly)*

PSYC 6099. Topics in Psychology. (3) A discussion of selected topics in psychology. *(On demand)*

PSYC 6102. Research Design and Quantitative Methods in Psychology. (3) Prerequisites: MATH 1222 and PSYC 2102 or equivalent. Experimental and correlational methods of psychological research, including single subject designs with emphasis on research design and the application of statistical methods to psychological research. *(Fall)*

PSYC 6107. Ethical and Professional Issues in Psychology. (2) Roles and responsibilities of psychologists, including ethical standards in professional

practice, testing and research; expectations and problems confronting psychologists in industrial, clinical and professional organizations. *(Fall)*

PSYC 6111. Psychology of Learning and Memory. (3) Principles, theories and current research in learning with emphasis on human learning and memory. *(On demand)*

PSYC 6112. Applied Behavior Analysis. (3) Use of behavior principles in applied settings. Topics include: behavioral assessment, positive and negative reinforcement, punishment, extinction, stimulus control, maintenance and generalization of behavior change. Each student will design and carry out a behavior change project. *(On demand)*

PSYC 6113. Physiological Psychology. (3) The relationships between the nervous system and behavior. Topics include the structure of the nervous system and nerve conduction, the functional organization of the central nervous system, neuronal and hormonal control of behavior, biofeedback and other appropriate topics. *(On demand)*

PSYC 6115. Sensation and Perception. (3) Processes involved in receiving and interpreting sensory data including all the sensory systems with an emphasis on vision. *(On demand)*

PSYC 6120. Developmental Psychology. (3) Psychological development across the lifespan. *(On demand)*

PSYC 6124. Psychology of Aging. (3) Psychology of aging with particular emphasis on issues related to community/clinical psychology and industrial/organizational psychology. Topics include myths and stereotypes about aging, problems faced by older workers, retirement, mental health and normal aging, counseling the older adult, and psychological disorders in later life. *(Spring)*

PSYC 6130. Social Psychology. (3) Human social behavior; topics include affiliation, person perception, conformity and attitudes. *(On demand)*

PSYC 6135. Psychology of Personality. (3) A critical evaluation of major personality theories including an extensive survey of current research. *(On demand)*

PSYC 6140. Psychological Measurement and Evaluation. (3) Prerequisite: PSYC 6102. Measurement of psychological characteristics; scaling, reliability, validity and norms; construction and use of the intelligence tests, personality inventories, interest tests, attitude scales, etc., interviewing, survey techniques and behavioral assessment. *(Spring)*

PSYC 6141. Intellectual Assessment. (4) Theories of intelligence and methods of intellectual assessment, including practice in administering intelligence tests, interpreting results, and writing evaluation reports. Three lecture hours and one two-hour lab per week. *(Fall)*

PSYC 6142. Personality Assessment. (4) Prerequisite: PSYC 6151, 6141 or permission of department. Theories and methods used in the assessment of personality and psychopathology, including practice in administering personality tests, interpreting results and writing evaluation reports. Three lecture hours and one two-hour lab per week. *(Spring)*

PSYC 6145. Applied Research Design and Program Evaluation. (3) Prerequisite: PSYC 6102. Models of evaluative research; also techniques, designs and administration of program evaluation. Topics include role conflicts, entry issues, goal setting, research for program planning and implementation and examples of actual program design and evaluation. *(Spring)*

PSYC 6150. Introduction to Psychological Treatment. (4) Prerequisite: PSYC 6151. Major approaches to psychological intervention, including psychodynamic, behavioral, humanistic and cognitive-behavioral systems. Emphasis on practical therapy considerations, including crisis intervention, client behaviors at various stages of therapy, handling difficult clients and ethical and professional issues. Three lecture hours and one two-hour lab per week. *(Spring)*

PSYC 6151. Behavior Disorders. (4) Diagnostic systems in current use and the implications of these systems for psychologists; several perspectives on psychological processes, behavior disorders and diagnosis including psychodynamic, behavioral and social models; practice in diagnostic interviewing. Three lecture hours and one two-hour lab per week. *(Fall)*

PSYC 6153. Classification of Psychological Dysfunctions. (3) Introduction to systems for classifying psychological disorders for counselors and review of current theoretical, experimental, and clinical perspectives on abnormal psychology, including the current Diagnostic and Statistical Manual of Mental Disorders. Credit will not be given for both PSYC 6153 and PSYC 6151. *(Spring)*

PSYC 6155. Community Psychology. (3) Research, intervention techniques and settings associated with major approaches in community psychology including the mental health, organizational, ecological and social action models. *(Fall)*

PSYC 6171. Industrial/Organizational Psychology. (3) Human behavior within organizations. Topics include personnel selection and placement, job analysis, motivation, satisfaction, consumer psychology and ergonomics. *(Fall)*

PSYC 6171L. Laboratory in Industrial/Organizational Psychology. (1) Corequisite: PSYC 6171. Practice in administration and scoring of surveys and tests. Experience in role plays, training practices, and interviews. *(Fall)*

PSYC 6172. Personnel I. (3) Prerequisite or corequisite: PSYC 6171, 6140. Techniques of applied personnel psychology. Topics include job analysis, testing in industry, interviews, personality measures, assessment centers, job evaluation, and polygraphs. *(Spring)*

PSYC 6173. Individual Dynamics. (3) The individual within the organization. Special emphasis on theories of motivation and job satisfaction. *(On demand)*

PSYC 6174. Organizational Dynamics I. (3) Prerequisite: PSYC 6171. Group processes, including group formation, group decision making, leadership and group structure. *(Spring)*

PSYC 6175. Organizational Dynamics II. (3) Prerequisite: PSYC 6174. Organization theories and organizational change methods. *(Fall)*

PSYC 6176. Counseling Psychology in Organizations. (3) Application of psychology to special problems within the organization, especially the counseling of employees experiencing life problems: for example, retirement, alcoholism, interpersonal conflict. *(On demand)*

PSYC 6177. Personnel II. (3) Prerequisite: PSYC 6172. Theoretical bases of personnel psychology. Topics include performance appraisal, legal issues, personnel strategies, validation issues, utility analysis, human resource planning and training. *(Fall)*

PSYC 6200. Health Psychology. (3) Intensive review of the contributions of the discipline of psychology to the promotion and maintenance of health, the prevention and treatment of illness, and the improvement of the health care system. The course will examine links between psychology and health by emphasizing interactions among biological, behavioral and social systems that impact health and illness experiences. Topics will include stress, coping, pain, chronic disease and psychoneuroimmunology. Emphasizes the relevance of age, gender, personality, and culture for understanding health related behaviors. *(Fall)*

PSYC 6202. Methods in Health Psychology. (3) Prerequisite: PSYC 6102 and PSYC 6200. Advanced review of qualitative and quantitative issues relevant to the conduct of health and behavior research. Topics include assessment of quality of life; instrument sensitivity, specificity, and responsiveness; and, the evaluation of health service delivery. Emphasizes the development of methodological, analytical, and interpretive skills necessary to evaluate practices, programs, and policies in health psychology. *(Spring)*

PSYC 6213. Physiological Foundations of Health Psychology. (3) Prerequisite: PSYC 6200. Biological theories and models will be introduced and applied to health issues. Topics may include addiction, mental illness, neuropsychology, and psychophysiology. Emphasizes the relation between the nervous system and behavior for understanding health and illness. *(Fall)*

PSYC 6230. Applications of Social Psychology to Health Psychology. (3) Prerequisite: PSYC 6200. Social psychology theories and models will be introduced and applied to health issues. Topics may include the role of social perception processes in understanding and adjusting to illness, social influence strategies and promoting health-maintaining behaviors, self-efficacy and coping, and other factors related to health maintenance or recovery. *(Spring)*

PSYC 6260. Topics in Health Psychology. (3) Prerequisite: PSYC 6200. An examination of selected topics in Health Psychology. May be repeated for credit with departmental approval. *(On demand)*

PSYC 6261. Independent Study in Health Psychology. (1-3) Prerequisite SYC 6200. Directed individual study of an issue in health psychology arranged with a faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

PSYC 6262. Internship in Health Psychology. (1-3) Prerequisite: PSYC 6200 and permission of the department. Experience in assessment and treatment with clients at local health agencies under supervision from a faculty member on campus. Applications of the principles of health psychology to special problems with in a health care organization or setting. May be repeated for credit with departmental approval. *(Fall, Spring, Summer)*

PSYC 6450. Practicum in Clinical Psychology. (1-3) Prerequisites: PSYC 6150 and permission of department. Experience in clinical assessment and/or psychotherapy with clients at local agencies under supervision from a faculty member on campus. May be repeated for credit with departmental approval. *(Fall, Spring, Summer)*

PSYC 6455. Practicum in Community Psychology. (1-3) Applications of the principles of community psychology to special problems within an organization or community setting. The project might include, but would not be limited to, consultation, program development, training, community education or program evaluation. May be repeated for credit with departmental approval. *(Fall, Spring)*

PSYC 6477. Projects in Industrial/Organizational Psychology. (1-3) Prerequisite: PSYC 6171. A structured practicum experience or research paper in industrial/organizational psychology. May be repeated for credit with departmental approval. *(Fall, Spring, Summer)*

PSYC 6899. Readings and Research in Psychology. (1-4) Prerequisite: permission of instructor and department to be obtained in the semester preceding the semester in which the course is to be taken. Individual study in psychology which may take the form of conducting empirical research or formulating a critique and synthesis of existing research. May be repeated for credit. *(Fall, Spring, Summer)*

PSYC 6999. Thesis. (1-3) The thesis is coordinated with the student's interests and practical experience during the second year to allow the development of an area of specialization. Thesis projects can be of three types: 1) an original experiment that will contribute to the psychological literature; 2) a thorough case analysis including literature review and application; 3) the development of a community psychology program or intervention to accomplish an important, well-defined goal. A completed paper and oral presentation are required. May be repeated for credit with departmental approval. *(Fall, Spring, Summer)*

PUBLIC ADMINISTRATION

Department of Political Science

440 Fretwell Building
(704) 547-2577
http://www.uncc.edu/polisci/mpahandbook.html

Degree

M.P.A.

Coordinator

Dr. Gary R. Rassel

Graduate Faculty

John A. Altman, Visiting Assistant Professor
A. Hunter Bacot, Assistant Professor
Dana B. Bradley, Assistant Professor
William P. Brandon, Metrolina Medical Foundation Distinguished Professor of Public Policy on Health
M. Maureen Brown, Assistant Professor
Carole L. Jurkiewicz, Assistant Professor
Gary R. Rassel, Associate Professor
Terrel L. Rhodes, Associate Professor
John W. Sommer, Knight Distinguished Professor of Public Policy
Carolyn R. Thompson, Associate Professor

Program of Study

The primary objective of the Master of Public Administration (M.P.A.) Degree program is to provide professional training in public administration. The curriculum emphasizes the analysis of the political and administrative environments as well as the administrative decision-making approaches of public administration. Application of techniques and administrative skills to the management of nonprofit organizations is also included in the curriculum. The methods of instruction employed in the program expose students to a variety of approaches to public management.

Students may enroll in the Master of Public Administration program on either a full-time or part-time basis. The majority of classes are scheduled in the evening throughout the year. However, some classes are scheduled on Saturdays and during the afternoon. Classes meet on the main campus and at UNC Charlotte Uptown Center.

Additional Admission Requirements

Admission to the Master of Public Administration program is open to qualified graduates of recognized colleges and universities accredited by a regional or general accrediting agency. There are seven major requirements for admission:

1) Application in writing submitted to the Graduate Admissions Office, accompanied by the application fee, which is neither deductible nor refundable.
2) Possession of a bachelor's degree, or its equivalent, from an accredited college or university.
3) An acceptable undergraduate record with an overall minimum GPA of 3.0
4) An appropriate score on the aptitude portion of the Graduate Record Examination (GRE) or Miller Analogies Test (MAT).
5) A statement of professional career goals and a description of any significant work experience.
6) Three supporting letters of recommendation from professors or employers.
7) Submission of two official transcripts from all postsecondary educational institutions in which the candidate was enrolled. Applicants not meeting the minimum GPA or advanced test scores may be considered for conditional admission.

Prerequisite Requirements

In addition to the admission requirements, MPA students must complete the following prior to taking comprehensive exams: POLS 1110, Introduction to American Government (or the equivalent); STAT 1222, Elementary Statistics for the Social Sciences (or the equivalent); and demonstrate proficiency in computer applications.

Degree Requirements

The Master of Public Administration program is structured into three distinct phases: 1) core, 2) advanced

work, and 3) directed study or research project. In all, the program requires 40 hours of graduate credit for completion of the degree.

1) Core
All students are required to complete 22 hours in core areas as defined by the program. The emphasis in the core is twofold: (a) Achieving an overall perspective on the problems of public administration, and (b) Comprehending the various managerial and analytical approaches salient to the environment of public administration. After completing the core requirements each student must successfully complete a comprehensive examination covering the core courses. The core courses are:

MPAD 6102 Legal and Institutional Foundations of Public Administration (3)
MPAD 6104 The Oretical and Ethical Foundations of Public Administration (3)
MPAD 6125 Quantitative Research Methods in Public Administration (3)
MPAD 6125L Computer Laboratory in Quantitative Research Methods (1)
MPAD 6128 Public Policy Analysis and Program Evaluation (3)
MPAD 6131 Public Budgeting and Finance (3)
MPAD 6134 Human Resources Management (3)
MPAD 6160 Information Systems in Public Administration (3)

2) Advanced Courses
a) Electives: The MPA program offers a number of advanced elective courses in areas important to public administrators including application of analytic tools and understanding of public administration processes. With the approval of the Coordinator, students may take advanced elective work with other departments. Students are required to take a minimum of nine hours of advanced electives. The MPA electives are:

MPAD 6000 Topics for Graduate Study in Public Administration (1-4)
MPAD 6140 Labor Management Relations in Government (3)
MPAD 6141 Conflict Management in Public Organizations (3)
MPAD 6142 Managing Grants and Contracts in the Public & Nonprofit Sectors (3)
MPAD 6144 Changing the Public Organization (3)
MPAD 6146 Introduction to Urban Administration (3)
MPAD 6160 Information Systems in Public Administration (3)
MPAD 6172 Administration of Health Care Systems in the U.S. (3)
MPAD 6174 Public Policy and Politics in Health Care Administration (3)
MPAD 6176 Trends and Issues in Health Care Administration (3)
MPAD 6185 Intergovernmental Relations (3)
MPAD 6210 Aging and Public Policy (3)
MPAD 6211 Administration of Aging Programs (3)
MPAD 6310 Foundations of the Nonprofit Sector (3)
MPAD 6311 Introduction to Nonprofit Management (3)
MPAD 6320 Strategic Planning for Nonprofit Organizations (1)
MPAD 6321 Resource Development in Nonprofit Organizations (1)
MPAD 6322 Volunteer Management (1)
MPAD 6323 Grant Writing (1)
MPAD 6324 Financial Analysis for Nonprofit Organizations (1)
MPAD 6325 Legal Aspects of Nonprofit Organizations (1)
MPAD 6820 Independent Study (1-3)

b) Capstone Seminar: Students are required to complete MPAD 6187: Advanced Seminar in Public Management Problem Solving as a capstone course after completing the comprehensive examination.

3) **Directed Study or Research Applications:** (each MPA student must complete either option "a" or "b" for 6 credits)

a) Directed Study: Students who select this option will complete a written project on a topic of significance based on a field experience or research in public administration or nonprofit management. The Directed Study requires the following courses, graded on a pass/fail basis:

MPAD 6800 Directed Study in Public Administration (Proposal) (3)
MPAD 6801 Directed Study in Public Administration (Completed Study) (3)

University regulations governing the preparation and submission of Master's theses apply to the Directed Study.

b) Research Applications: Students who select this option will complete a one-semester written project on an approved topic of significance in public administration or nonprofit management. The project will include the submission of revised paper drafts based on instructor evaluation. Students must enroll in the following course graded A, B, C, U format:

MPAD 6188 Research Applications in Public Administration (3)

Students who select this option must also take one additional elective course for 3 credits to complete the 40 hours required for the MPA degree.

Admission to Candidacy Requirements

Students are required to complete an "Application to Candidacy" form no later than the early part of the semester they wish to graduate. This form lists all courses to be counted toward the degree. It should be signed by the student and returned to the MPA Program office.

Assistantships
The department offers a number of graduate assistantships each academic year. To apply for an assistantship students must submit a completed "Application for Graduate Assistant" form and a copy of their resume to the MPA Coordinator. Graduate assistantships are also available in several administrative units on campus.

Internships
Each student in the Master of Public Administration Program is required to complete a field experience. This requirement may be satisfied in one of these ways: (1) through a full-time position in a public or nonprofit organization; (2) through a full-time position in a business where the work experience is approved for internship; or (3) through an approved internship in a public or nonprofit organization. Each student must complete an "MPA Internship Information" form and submit it to the MPA office for approval.

Track Descriptions
Currently the MPA Program has a concentration in the Management of Nonprofit Organizations. This concentration requires completion of the core courses and MPAD 6187. The nonprofit concentration consists of 15 credit hours within the MPA curriculum. MPAD 6310, Foundations of the Nonprofit Sector; MPAD 6311, Introduction to Nonprofit Management; and MPAD 6188, Research Applications, each for three credits, are required. The focus of the paper in MPAD 6188 must be an approved topic in the nonprofit field. An additional 6 credit hours from the following courses.are also required:

MPAD 6142	Grant and Contract Management in the Public and Nonprofit Sectors (3)
MPAD 6320	Strategic Planning for Nonprofit Organizations (1)
MPAD 6321	Resource Development in Nonprofit Organizations (1)
MPAD 6322	Volunteer Management (1)
MPAD 6323	Grant Writing (1)
MPAD 6324	Financial Analysis for Nonprofit Organizations (1)
MPAD 6325	Legal Aspects of Nonprofit Organizations (1)

Students may petition to take courses from other departments as well.

Capstone Experiences
Students are required to complete the following capstone course after successfully completing the comprehensive examination: MPAD 6187, Advanced Seminar in Public Management Problem Solving.

Advising
Each student is assigned an advisor and given a copy of the MPA Program Handbook when admitted to the program. The advisor is a member of the MPA Program faculty. Students should meet with their advisors to develop a schedule each semester before registering. Students are also encouraged to meet with the Program Coordinator.

Transfer Credit
Up to 6 credits taken at another University can be transferred to the MPA program on the recommendation of the Coordinator and the Dean of the Graduate School. In some cases, additional transfer credits may be accepted.

Comprehensive Examination
Upon completion of the core courses, each student must successfully complete a written comprehensive examination designed to test knowledge and/or skills of administrative analysis and administrative theory and practice. It is the responsibility of the student to take the requisite courses and the comprehensive examination in a timely-fashion. All MPA core courses are offered at least once during the fall, spring or summer semesters. Comprehensive exams are administered twice a year. Comprehensive exams must be completed before students can take the capstone course, Directed Study or Research Applications.

Application for Degree
Students are required to file an "Application for Degree" with the Registrar's Office in the semester prior to the one in which they plan to graduate. The due dates for this application are announced in the course catalog each semester

Research Opportunities/Experiences
Many faculty have grants which help them employ graduate students to aid them in research.

Scholarships
1) The North Carolina City and County Management Association funds a scholarship for an MPA student to help train students for careers in North Carolina local government. The MPA Program selection committee nominates the eligible recipient each fall. 2) Burkhalter Alumni Scholarship. The MPA Alumni Association has established a scholarship fund to honor a former Charlotte City Manager. 3) Other awards are available on a competitive basis through the Graduate School.

Tuition Waivers
Out-of-state tuition waivers are available to students appointed to graduate assistantships. These are awarded on a competitive basis. Partial waivers of in-state tuition are also awarded competitively to students who are residents of North Carolina. A limited number of partial tuition awards are made available through the Graduate School.

Financial Assistance

Other forms of financial aid, such as loans, are available. Students should contact the Financial Aid Office at 704-547-2461 for further information. Several administrative units on campus also employ graduate students.

Courses in Public Administration

MPAD 6000. Topics for Graduate Study in Public Administration. (1-4) Intensive study of a topic in public administration. The topic of investigation may vary from semester to semester. May be repeated for credit. *(On demand) (Evening)*

MPAD 6102. Legal and Institutional Foundations of Public Administration. (3) Consideration of the political context of contemporary public administration, with attention to the role of administration in the policy process, the legal basis for public administration, legislative-executive relations, and accountability and responsibility in democratic administration. *(Fall, Spring) (Evening)*

MPAD 6104. Theoretical and Ethical Foundations of Public Administration. (3) Changing images of people, organizations and organizational environments; research findings and applications related to organization structure, motivation, leadership, communications, decision-making, group dynamics, interpersonal skills; ethics and values important to the study and practice of organizational leadership; and assessment of value systems and the impact of competing value systems on public and organizational policy making. *(Fall, Spring) (Evening)*

MPAD 6125. Quantitative Research Methods in Public Administration. (3) Corequisite: MPAD 6125L. Prerequisite: elementary statistics or equivalent. Introduction to the use of quantitative analysis in administration. Special emphasis on issues of research design, data collection, elementary statistical analysis, and the interpretation and presentation of research findings. *(Fall, Spring) (Evening)*

MPAD 6125L. Computer Laboratory in Quantitative Research Methods in Public Administration. (1) Corequisite: MPAD 6125. Hands-on computer experience to master the substantive materials taught in Quantitative Research Methods. *(Fall, Spring) (Evening)*

MPAD 6128. Public Policy Analysis and Program Evaluation. (3) Analysis of the policy making process with particular attention to the role of public administration. Development and application of policy analysis methods, methods of evaluation, research design and measurement, and methods to incorporate program evaluation with planning, budgeting and personnel management. *(Fall or Spring) (Evening)*

MPAD 6131. Public Budgeting and Finance. (3) An introduction to the basics of public finance and an examination of the theory and development of public budgeting, the budget processes, the budget cycle, budget reforms, capital budgets, revenue sources, taxation policies and processes, intergovernmental fiscal relations and governmental accounting practices, debt management and cash management in public organizations. *(Spring) (Evening)*

MPAD 6134. Human Resources Management. (3) Study of the context of public personnel administration; basic functions of job evaluation and compensation, employee rights and responsibilities; the legal constraints including equal opportunity, health and safety, collective bargaining; government productivity. (Same as HADM 6147) *(Spring) (Evening)*

MPAD 6140. Labor Management Relations in Government. (3) Public employee unionization, collective bargaining, unit determination and recognition; negotiation; third-party process; administration of agreements. *(On demand) (Evening)*

MPAD 6141. Conflict Management in Public Organization. (3) The role of the administrator as a focal point in social change and the management of the conflict which occurs. Perspectives on the negotiation and bargaining process will be reviewed. *(On demand) (Evening)*

MPAD 6142. Managing Grants and Contracts in the Public & Nonprofit Sectors. (3) Understanding government contracting and practice in government grant proposal writing with the development of contract administration skills. *(On demand) (Evening)*

MPAD 6144. Changing the Public Organization. (3) Overview of concepts and methodologies of organization development, diagnosing organizational needs, change strategies and interventions. *(On demand) (Evening)*

MPAD 6160. Information Systems in Public Administration. (3) Issues involved in administering and managing information system resource activities in public organizations. Topics include the system development life cycle including issues ranging from information system design and development through installation and evaluation. Special emphasis on challenges to achieving improved performance through information technologies in the public sector. (On demand) (Evening)

MPAD 6170. Communication Law and Policy. (3) This course is designed for those students with an interest in the law of public communication. Subjects such as First Amendment theory, censorship, hate speech, libel, invasion of privacy, obscenity, indecency, and commercial speech rights will be examined. Through a casebook and lecture approach, students will become well versed in

current Constitutional law in these and other areas. No prior legal coursework is required. *(On demand) (Evening)*

MPAD 6172. Administration of the Health Care Systems in the United States. (3) Components of the health care system in the United States, with emphasis on the relationships among public (local, state and federal), private, voluntary and nonprofit entities; including points of access for recipients of health care; relationships with other human services and professions involved in providing health care; and the regulatory environment governing these relationships. (Same as HADM 6112) *(On demand) (Evening)*

MPAD 6174. Public Policy and Politics in Health Care Administration. (3) Examination of the formulation, adoption and implementation of public policy for health care through federal, state and local political processes. *(On demand) (Evening)*

MPAD 6176. Trends and Issues in Health Administration. (3) Examination of current issues confronting health care managers and an assessment of current programs and management responses to emerging trends in the health care field, including delivery systems, marketing/competition, strategic planning, financial management and/or epidemiological changes. *(On demand) (Evening)*

MPAD 6185. Intergovernmental Relations. (3) Survey of the complex relationships of governments in an urban environment set in the federal system. A review of the problems created by that system and the approaches to their solutions. *(On demand) (Evening)*

MPAD 6187. Advanced Seminar in Public Management Problem Solving. (3) Seminar viewed as a capstone to the student's coursework in public management and is required to be taken by all students. Seminar devoted to topics in public management which involve problem identification and solution. *Permit Only. (Fall, Spring) (Evening)*

MPAD 6188. Research Applications in Public Administration. (3) Prerequisite: all core courses and passing of comprehensive examination. Preparation of a major paper on a topic of significance in public or nonprofit administration. Topics must be approved by the instructor, and paper drafts will be revised by the student following evaluation by the instructor. Each paper must be well-grounded in the appropriate professional literature and must demonstrate competence in professional communication skills. *Permit Only. (Fall, Spring) (Evening)*

MPAD 6210. Aging and Public Policy. (3) Examination of the public policy making process with attention to aging policy. Consideration of determinants of aging policy and institutions and actors in the policy making process and piecemeal development of legislation will be analyzed as factors related to the making of policy for the aged. (Same as GRNT 6210) *(Yearly) (Evenings)*

MPAD 6211. Administration of Aging Programs. (3) Focus will be the implementation of public policies and programs for the aged and the development and administration of these programs. Students will become familiar with the process through which policies are transformed into aging programs and the budgetary, management and evaluative considerations that must be considered. (Same as GRNT 6211) *(Yearly) (Evenings)*

MPAD 6310. Foundation of the Nonprofit Sector. (3) Survey of the history, culture and legal foundation of the nonprofit sector. Key definitions, scope and relationships between the nonprofit, for profit and government sectors are discussed. Examines current policy issues confronting nonprofits. *(Fall)*

MPAD 6311. Introduction to Nonprofit Management. (3) Examination of the structure, function and administration of nonprofit organizations. Developing strategies to insure financial and ethical management. *(Spring)*

MPAD 6320. Strategic Planning for Nonprofit Organizations. (1) Long and short range planning. Developing mission statements, conducting environmental assessments, writing, implementing, evaluating, and revising the plan will be covered. Addresses strategies for incorporating staff, board and community viewpoints. *(On Demand)*

MPAD 6321. Resource Development in Nonprofit Organizations. (1) How nonprofit organizations set revenue goals, select fund-raising techniques, allocate personnel and volunteers and evaluate results. How nonprofit organizations should manage their relationships with different funding sources to maximize fund raising potential. *(On Demand)*

MPAD 6322. Volunteer Management. (1) Examines the changing role of volunteerism in the nonprofit organization. Topics include developing a strong and diverse volunteer work force and recruiting, screening and placement, orienting, managing, evaluating and recognizing volunteers.

MPAD 6323. Grant Writing. (1) Topics include conducting prospect research, making initial contacts with funders and preparing, submitting and following up on grant proposals. *(On Demand)*

MPAD 6324. Financial Analysis for Nonprofit Organizations. (1) Evaluating the financial condition of the nonprofit organization. Topics include preparation of financial statements, using financial statements to assess and monitor financial condition. Classification of accounts, role of the auditor, and financial responsibilities of boards of directors. *(On Demand)*

MPAD 6325. Legal Aspects of Nonprofit Organizations. (1) The legal requirements and issues of liability for nonprofit organizations. These include: required financial reports; tax exempt status; tort liability; and legal responsibilities of boards of directors.*(On Demand)*

MPAD 6800. Directed Study in Public Administration. (3) Prerequisite: all core courses and passing of comprehensive examination. Individual project proposal on a directed topic of significance based on field experience in public administration. Pass/In Progress grading. *Permit Only. (Fall, Spring) (Evening)*

MPAD 6801. Directed Study in Public Administration. (3) Prerequisite: MPAD 6800. Individual project report on a directed topic of significance based on field experience in public administration. Pass/In Progress grading. *Permit Only. (Fall, Spring)*

MPAD 6820. Independent Study. (1-3) Prerequisite: consent of the instructor and the MPAD Coordinator. Supervised study of a public administration topic or problem of special interest to the student, within the instructor's expertise, and normally an extension of previous coursework with the instructor.*(Fall, Spring, Summer)*

MPAD 7999. Graduate Residence. (1) Maintains continuous enrollment as required by University policy. *(Fall, Spring) (Evenings)*

SOCIAL WORK

Department of Social Work Department

460 K Fretwell Building
(704) 547-4667
http://www.uncc.edu/socantsw/

Degree

M.S.W.

Coordinator

Dr. Philip Popple

Graduate Faculty

Linwood Cousins, Associate Professor
James Dudley, Professor
Sondra Fogel, Assistant Professor
Elise Fullmer, Associate Professor
Deana Morrow, Assistant Professor
Philip Popple, Professor
Carole Winston, Assistant Professor

Program of Study

The Master of Social Work (MSW) degree prepares students for advanced social work practice with individuals, families, and small groups in public, voluntary, and proprietary human service settings. The program also prepares its students to address many of the social and individual problems/needs of people, particularly the low income and vulnerable populations.

The course of full-time study over four semesters requires 60 hours of course work beyond the bachelor's degree from an accredited college or university. Students who have earned a Bachelor of Social Work degree from a Council on Social Work Education (CSWE) accredited school with at least a B average in all required social work courses may qualify for the Advanced Standing program.

The UNC Charlotte Social Work Program has offered a CSWE accredited BSW degree since 1995. The department is applying for accreditation of the MSW degree and has been approved for the first stage of candidacy. It is anticipated that the candidacy process will be completed by fall of 2000. Full accreditation cannot be applied for until the first class graduates in 2002. The accreditation is retroactive for that class.

The curriculum focuses on preparation for advanced social work practice in the range of human service agencies employing professional social workers, including youth and family agencies, child and adult protective services, schools, area mental health agencies, health care settings, neighborhood service centers, as well as the rapidly expanding social services provided by the for-profit sector. During the first year, students will identify a field of practice for specialized study to be emphasized during their second year.

Additional Admission Requirements

Students admitted to the two-year program begin in the Fall semester. Students admitted to the advanced standing program begin in the first summer term. In addition to the general requirements for admission to the graduate school, applicants for the M.S.W. program:

1) Must have a minimum grade point average of 3.0 for the last two years of their undergraduate work.
2) Social work applicants are required to submit the Statement of Purpose Form included in the graduate application package, but this should be expanded to four or five pages in length to include the following:
    a) Your reasons for seeking graduate social work education at this time. If you are currently working in a social service job, explain your reasons for pursuing further formal education. If you are changing fields, discuss your reasons for doing so. Explain why you are making this change now.
    b) How your life experiences have led you to seek a graduate social work degree. How do you account for your interest in social work?

c) Your personal strengths and limitations for the practice of social work.
d) The particular aspects of social work that interest you most .
e) What you see yourself doing professionally five years in the future.
f) Diversity is a valued aspect of the social work program. How do you think you might enrich the class with your cultural experiences, unique skills, and interest?
g) Your activities in social work organizations and any honors you have received.
h) Your signature and date.

3) An attachment to the essay outlining the applicant's educational, work and volunteer experience, and special skills or attributes. The attachment should total no more than two pages and should be in resume format to include:
   Personal data: Name, address, phone number, email address
   Educational experience: Institutions and the dates you attended
   Your academic degrees awarded, including majors and minors
   Work experience: List all positions in chronological order (beginning with most recent) with a 2-3 line job description for each.
   Include all beginning and ending dates for each position.
   Identify if a MSW or a BSW level social worker supervised you.
   Indicate whether the position was full-time or part-time.
   Volunteer experience: List all positions in chronological order (beginning with most recent) with a 2-3 line job description for each.
   Include all beginning and ending dates for each position.
   Identify if an MSW or a BSW level social worker supervised you.
   Professional affiliations and honors from your school, profession, or community:
   List any memberships in professional organizations and service groups
   List any offices held in these organizations.
   Add honors or special awards received.

4) Three Letter of Recommendation Forms. If you are a recent graduate, at least two must be from faculty members. For applicants who have been out of the education system for some time, letters should be from someone who can comment on your suitability for graduate education. It is recommended that at least one reference be from a professional working in the applicant's field of interest.

Upon acceptance to the program, students will be asked to complete an Intent to Enroll form and a Field Application Form. Because some field placement agencies serving vulnerable populations exclude personnel with criminal convictions, students entering the program may be subject to a criminal history inquiry. Many agencies require drug testing as well.

Degree Requirements

Foundation Curriculum (first year):

SOWK 6131	Social Work Research I: Introduction to social science research methods (3)
SOWK 6111	Social Welfare Policy I: Theory and philosophy of social welfare policy and programs (3)
SOWK 6101	Human Behavior and the Social Environment I: Individuals, families, and small groups (3)
SOWK 6121	Social Work Practice I: Theories and skills in practice with individuals, families, and groups (3)
SOWK 6441	Social Work Practicum I: Application of foundation knowledge, values, and skills to practice settings (3)
SOWK 6232	Social Work Research II: Philosophies and methods of evaluating social work practice and programs (3)
SOWK 7112	History and Systems of Social Work Practice: Social and policy context of the evolution of social work practice theory and method (3)
SOWK 6202	Human Behavior and the Social Environment: Groups, organizations, and communities (3)
SOWK 6222	Social Work Practice II: Theories and skills in practice with groups and communities (3)
SOWK 6442	Practicum II: Application of foundation knowledge, values, and skills to practice setting (3)

Advanced Curriculum (second year):

SOWK	Human Behavior and the Social Environment: Theories of mental illness, DSM-IV (3)
SOWK	Advanced Interpersonal Practice with Individuals: Evaluation and intervention methods (3)
SOWK	Advanced Interpersonal Practice with Families: Diversity among family systems, intervention models (3)
SOWK	Practicum III: Application of advanced knowledge, values and skills to practice settings (3)
SOWK	Two Field of Practice Electives selected according to the student's specialty (6)

Social Work Elective: Seminar in Advanced Practice.
Student chooses either:

SOWK	Social Work in Entrepreneurial Environments (3)
SOWK	Social Work in Organizations (3)

SOWK Advanced Interpersonal Practice with Small Groups: Group development and facilitation methods (3)

Field of Practice Seminar

SOWK Field of Practice Seminar: Study of theory and practice issues of student's specialty (3)

SOWK Practicum IV: Application of advanced knowledge, values and skills to practice setting (3)

Advanced Standing Program

Applicants who have obtained a BSW from an accredited Social Work Program and who demonstrate high academic achievement may qualify for Advanced Standing status. Advanced Standing students complete the MSW degree in two semesters and two summer school sessions, during which they complete:

SOWK Social Welfare Policy I: Theory and philosophy of social welfare policy and programs (3)

SOWK Social Work Research I: Introduction to social science research methods (3)

SOWK Introduction to Fields of Practice: preparation for entry into advanced practice courses (3)

Individualized Field of Practice Specialization

All students in the MSW program will complete course work leading to expertise in theories and techniques of social work practice with individuals, families, and small groups. In addition each student will be required to select a field of practice from the areas of health/mental health, families and children, aging, and poverty/public welfare. Within these four general areas students may select more narrow specializations. For example, a student may select adolescent mental health from within the health/mental health area, or child abuse and neglect from the families and children area. Students specializing in aging will have the opportunity to earn a certificate in gerontology in addition to their MSW. Students will bear major responsibility for developing their own field of practice specialization, which they will do in three ways. The first is that students will be required to select topics for papers and projects in each class which are related to the student's field of practice specialization. These papers and projects will be kept in a portfolio which will be evaluated by faculty during the final semester of the program. Second, students will be required to select at least two electives from courses related to their field of practice. Finally, the student's second year field practicum will be in an agency related to the student's field of practice specialization. The final semester students will complete a field of practice seminar in which they will write a major paper describing the individual field of practice area in which they have developed expertise.

The Field Placement

Placements are assigned from a variety of agencies and practice settings approved by the UNC Charlotte Social Work Program. Field Instructors, approved by the program, guide the student through learning experiences, coordinating field experiences with the concurrent classroom coursework. The first year of field placement will focus on generalist interpersonal practice skills. The second year of placement, in a different setting, focuses on specialized practice with a specific population. Advanced interpersonal practice skills are developed and refined during the second year of study.

State Certification

Graduates of the Program will qualify for State Certification at three levels: Licensed Clinical Social Worker, Certified Master Social Worker, and Certified Social Work Manager, issued by the North Carolina Certification Board for Social Work. In all of these cases, graduates must pass a state-sponsored exam. The LCSW requires, in addition, evidence of two years of post-masters clinical practice with LCSW supervision. Graduates who specialize in school social work will qualify for School Social Worker certification, issued through the North Carolina Department of Public Instruction.

Financial Assistance

Paid internships and assistantships are limited. Contact the department.

SOCIOLOGY

Department of Sociology

476 Fretwell Building
(704) 547-4296
http://www.uncc.edu/gradmiss/sociomas.htm

Degree

M.A.

Coordinator

Dr. Teresa L. Scheid

Graduate Faculty

Judy R. Aulette, Associate Professor
Thomas R. Forrest, Associate Professor
Rosemary L. Hopcroft, Associate Professor
Ira Hutchison, Professor
Larry M. Lance, Associate Professor
Roslyn Mickelson, Professor
James Peacock, Assistant Professor
Michael A. Pearson, Associate Professor
Lisa Slattery Rashotte, Assistant Professor
Teresa L. Scheid, Associate Professor
Murray Webster, Professor

Dr. M. Dwayne Smith, Professor
Dr. Joseph Whitmeyer, Associate Professor
Dr. Diane Zablotsky, Associate Professor

The Master of Arts in Sociology degree program provides students with the theoretical and methodological skills necessary to undertake analysis of contemporary social issues and problems. The concentration in Applied Research is designed to meet the needs of students seeking master's level research skills in occupations requiring such expertise: in government, marketing, program planning and evaluation, business, the media and in the non-profit sector. The curriculum also prepares students who wish to pursue a Ph.D., whether in Sociology or a related discipline (such as Criminology or Public Policy). The Department is proud of its great diversity in substantive interests and theoretical perspectives. At the same time, it gives special emphasis to the following specialty areas: family, gerontology, health, education, and social psychology.

Program of Study

Coursework in the program concentrates on building skills in research design, data analysis, interpretation and application of sociological theory to concrete problems. In addition to traditional classroom courses, students can tailor their coursework to specific areas of interest through individualized tutorials (up to 6 hours). Tutorials involve directed reading and/or research in a specialized area. Through coursework and tutorials students can gain a substantial knowledge base that complements their research skills. Students complete a thesis with an oral defense or else a research practicum. Either option entails the student applying sociological knowledge to a problem/topic of their interest.

Additional Admission Requirements

An overall undergraduate GPA of 3.0 or better
An acceptable score on the Aptitude Portion of the Graduate Record Examination (GRE)
Completion of a minimum of 18 hours in undergraduate coursework in the social sciences, including social theory
Demonstrated undergraduate competence in research methods and statistics for social research.

Prerequisite Requirements

Sociological Theory, Research Methods, Statistics for Social Research

Degree Requirements

The program requires 35 semester hours of coursework. To provide all students with a solid grounding in theory and methods of sociological inquiry, 18 hours of core courses are required (see below). Students must then complete either a thesis (6 hours) or a research practicum (6 hours). The remaining 11 hours are electives, of which only 6 hours can be from outside the department. Students may transfer in up to 6 hours of credit from another institution.

Students must earn at least a B in core, required classes (Social Theory, Statistics, Research Methods, and Dilemmas in Organizations). Students earning a C in one of these courses must repeat the course the next time it is offered. Students earning a C in two of these courses will be disenrolled from the program.

Admission to Candidacy Requirements

Completion at least 24 hours of required work.

Assistantships

The Department of Sociology has four teaching assistantships and several research assistantships, dependent upon faculty research funding. Teaching assistants assist faculty with coursework, or teach the undergraduate lab sections in research methods and statistics and are paid approximately $8,000.00 for nine months at twenty hours per week during the academic year. The workload and pay for research assistants varies. Assistantships are awarded on the basis of merit and experience.

Internships

While there is not a formal system of ongoing internships, agencies do contact the department to find students who would be interested in an internship. Consequently, internships are optional and dependent upon a match between an agency's needs and a student's skills and interests.

Practica

There is the option of a research practicum, which may be combined with an internship. The student would work with an organization or agency and complete a research evaluation project for the agency. This is for 6 hours of credit and is an alternative to the traditional thesis.

Core Courses

SOCY 5151	Pro-Seminar: Social Problems and Social Policy (3) (Fall)
SOCY 6651	Social Theory (3) (Spring)
SOCY 6652	Issues in Social Research (3) (Spring)
SOCY 6615	Dilemmas in Organizations (3) (Fall)
SOCY 6653	Advanced Quantitative Analysis (3) (Spring)
SOCY 6617	Data Utilization (alternative years) or alternative methods course (SOCY 6136. Qualitative Research Methods, SOCY 6640 Evaluation Research for Applied Sociology, SOCY 5630 Investigating Health and Health Services) which are available alternative years or on demand.

Capstone Experiences

Thesis or Research Practicum

Electives
Course at 5000 level or above in Sociology, or up to 6 hours from other departments.

Advising
The Graduate Coordinator advises all graduate students until they select a person to serve as their Committee Chair.

Transfer Credit
With departmental approval, students may transfer up to six hours of graduate work for which the applicant received a grade of B or better from another institution or related UNC Charlotte program.

Committee
The students committee shall consist of three faculty: the Chair and two other individuals who assist with completion of the thesis or research practicum. One member of the committee may be from outside the department.

Thesis
Students are to formulate a research question or argument, and to collect evidence to answer that question, or support their argument.

Research Opportunities/Experiences
All faculty are actively engaged in research, and students are strongly recommended to work with faculty to develop research expertise. In addition, a number of faculty have funded research projects or internships which qualified graduate students are able to work on.

Tuition Waivers
Both out of state and in-state tuition waivers are available.

Financial Assistance
Contact the Department about Graduate Assistantships

Courses in Sociology

SOCY 5111. Social Inequality. (3) Distribution of power, privilege and prestige; correlates and consequences of inequality; national and international comparisons.

SOCY 5125. Urban Sociology. (3) Cross cultural analysis of urban development, social structure, ecology, demographic composition, and social problems.

SOCY 5130. Sociology of Health and Illness. (3) The cultural and structural influences on the definition of health and illness; models of illness behaviors; health demography and epidemiology; social influences on the delivery of health care; ethical issues surrounding health and illness; the development of relevant social policy.

SOCY 5131. Family Policy. (3) Critical analysis of four aspects of family policy; the historical and cultural factors that have resulted in specific policies affecting the family; the specification of contemporary family policy at both the national and state level; the intended and actual application of existing family policy; and the implications and impact of policies as they are interpreted and implemented.

SOCY 5134. Families and Aging. (3) Theories explaining the formation and functioning of American families with emphasis on the impact of the aging of society; examination of the current demographic trends and expectations of multigenerational families as well as the future demands and modifications.

SOCY 5135. Sociology of Education. (3) Educational institution; the school class as a social system; the school as a social environment and a complex organization.

SOCY 5150. Older Individual and Society. (3) Review of the theories explaining the formation and functioning of American families with emphasis on the impact of the aging of society. Examination of the current demographic trends and expectations of multigenerational families as well as the future demands and modifications.

SOCY 5151. Pro-seminar: Social Problems and Social Policy. (3) Prerequisite: graduate student in sociology or senior sociology major. Introduction to applied sociology, proposal writing and grantsmanship, professional ethics and professional socialization. Overview of major research areas in applied sociology.

SOCY 5154. Contemporary Social Theory. (3) Elements and process of theory construction; contemporary social theories such as theories of social order and causation, power, class structure and inequality; group process theories; post-modern theories.

SOCY 5156. Quantitative Analysis. (4) Concepts and procedures of sociological analysis; data processing; measurement theory; quantitative models of analysis. Three hours of lecture/discussion and completion of weekly laboratory units *(Fall, Spring)*

SOCY 5630. Investigating Health and Health Services. (3) Prerequisites: SOCY 4130, or graduate standing, or permission of instructor. Useful to those seeking research careers, to administrators in health care, and to primary care providers. How to conduct and evaluate research in health care settings, emphasizing both quantitative and qualitative methodologies as well as the utilization of secondary data. *(Every other year)*

SOCY 5631. Seminar in Family Violence. (3) Prerequisite: senior, graduate student or consent of the instructor. Family violence in the context of a changing society and family system. Principal foci: child abuse,

sexual abuse, spouse abuse; other forms of family violence. Investigation of these topics in terms of sociocultural influences and internal dynamics of families. *(Spring) (Evenings)*

SOCY 5632. Changing American Family. (3) Family theories; family system in relation to other social systems; integration of marital, parental and occupational roles in context of changing socioeconomic influences; traditional versus contemporary family roles; breakdown in stable family functioning. *(Fall) (Evenings)*

SOCY 6090. Topics in Sociology. (3) Prerequisite: consent of department. Intensive treatment of a topic or survey of related topics, depending on student needs and interests. may be repeated for credit as topics vary *(On demand)*

SOCY 6130. Sociology of Aging: Theories and Research. (3) Application of stratification theories and demography are applied to the older population. Issues of race, gender, socio-economic status, age, and geographic distribution are examined to investigate the diversity of the older age group and their access to resources. (Yearly)

SOCY 6135. Social Context of Schooling. (3) The political economy of schooling; race, class, and gender effects on educational processes and outcomes; the school as a complex organization; the sociology of school reform movements. *(Fall)*

SOCY 6136. Qualitative Research Methods. (3) Collection and analysis of qualitative data including use of grounded theory and a variety of qualitative techniques, consideration of ethical issues and the use of data *(Alternate years)*

SOCY 6137. The Political Economy and School Reform. (3) Prerequisite: SOCY 4135, graduate status, or consent of instructor. Relationship between the business community's vision for school reform and the school restructuring movement locally and nationally, including social and political processes associated with corporate involvement in defining the problem with schools and shaping solutions, the intersection of education and the economy, and the relationship between schooling and social inequality. *(On demand)*

SOCY 6138. Social Organization of Health Care. (3) Focuses on the structures and operations of health care institutions and providers. The topics covered include the socio-historical development of the existing health care system, health care occupations and professions, professional power and autonomy, professional socialization, inter-professional and provider-patient relations, health care organizations and the delivery of services, and how social change affects the health care sector. *(On demand)*

SOCY 6614. Self and Society. (3) Examination of theoretical constructs and substantive concerns relevant to the socialization process; comparison of symbolic interactionism, ethnomethodology, phenomenology; emphasis on social construction of reality in various "social worlds" (deviant, work, family). *(Alternate years)*

SOCY 6615. Dilemmas in Organizations. (3) Examines organizational theory and research focused on organizational behavior, inter-organizational relations, relations with external stakeholders and organizational culture. Case study analysis, group-problem solving and the study of concrete organizational dilemmas. *(Fall)*

SOCY 6616. Stratification and Inequality. (3) Examination of theories of stratification and the causes, processes and social consequences of economic and political inequality; assumptions behind, mechanisms for, and consequences of government and private sector strategies to address problems associated with inequality. *(Alternate years)*

SOCY 6617. Data Utilization. (3) Methodological and statistical strategies for applied sociological research within organizational settings; selecting the best strategies consistent with budgetary, manpower and organizational constraints; interpreting and communicating research results in ways understandable to and useful for organizational decision-makers. *(Alternate years)*

SOCY 6640. Evaluation Research for Applied Sociology. (3) Prerequisites: SOCY 6652 and introductory statistics. Evaluation research from an applied sociological perspective, including incorporation of social theory, substantive social science knowledge, and research techniques into the evaluation of a variety of programs, interventions, and policies. *(Alternate years)*

SOCY 6651. Social Theory. (3) Analysis of contemporary social theories, with emphasis on their implications for planned change. *(Yearly)*

SOCY 6652. Issues in Social Research. (3) Examination of epistemology of social research; assumptions and methods of specific research strategies; ethical and policy issues of applied and academic research. *(Alternate years)*

SOCY 6653. Advanced Quantitative Analysis. (3) Prerequisites: six hours in Introductory Statistics and/or Research Methods. Contemporary techniques of data analysis, management and processing applied to specific topics; measurement models, data reduction strategies, and multivariate procedures. *(Alternate years)*

SOCY 6895. Tutorial in Sociology. (1-4) Prerequisite: permission of instructor. Directed reading and/or research; development of expertise in substantive area. May be repeated for credit *(Fall, Spring, Summer)*

SOCY 6897. Research Practicum. (1-6) Prerequisite: SOCY 6651 and 6652. Preparation of research paper based upon research completed within a community organization or agency. The student will develop a consultant-client relationship with the agency or organization and conduct a research/evaluation project on behalf of the agency or organization (such as a needs assessment, program evaluation, social impact assessment or policy analysis. *(Fall, Spring)*

SOCY 6996. Thesis. (1-6) Prerequisites: completion of all other coursework and admission to candidacy by Graduate Committee. Applied, academic, or theoretical research project, defended before graduate faculty. May be repeated for credit up to six hours.*(Fall, Spring, Summer)*

SOCY 7999. Graduate Residence. (1) Continuation of individual thesis project. *(Fall, Spring)*

GENERAL GRADUATE COURSES

Course Descriptions. Course descriptions provide the following information: subject prefix; course number; course title; semester credit hours assigned to the course; prerequisites and/or corequisites (if any); brief description of the course content; and when the course usually is offered (Evenings, Yearly, Alternate years, Fall, Spring, Summer, On demand). The description may specify the number of class (lecture) and/or laboratory sessions and hours. If no class hours are given, the number of class hours per week is the same as the number of semester hours credit assigned to the course. For example:

> **SUBJ 1234. Title of Course. (Credit Hours)** Pre/corequisites. Brief description of course content. (Three lecture hours and one three-hour laboratory per week) (When offered)

Course Numbering System. Courses are identified by four-digit numbers. The first digit indicates the level of the course: **5000-7999:** graduate only; **8000-8999:** doctoral only. The following second digits designate special types of courses: 0 for topics; 4 for internships and practica, 5 for cooperative education, 6 for seminars, 7 for honors courses, 8 for independent study, and 9 for research. (Note that undergraduate courses are numbered in the 1000-4999 levels.)

ANTHROPOLOGY

ANTH 5090. Topics in Anthropology. (3) Prerequisite: consent of the instructor. Intensive treatment of a topic in anthropology or survey of related topics, depending on student needs and interest. May be repeated for credit as topics vary.*(On demand)*

ANTH 5110. American Ethnic Cultures. (3) Prerequisite: ANTH 1101 or consent of instructor. An anthropological and ethnohistorical survey of ethnicity, persistence and cultures of the ethnic groups of America. Topics include theories of ethnicity, immigration, ethnic identity, reasons for immigration, acculturation experiences, and cultural characteristics of established and more recent ethnic groups. *(On demand)*

ANTH 5120. Intercultural Communications. (3) Prerequisite: ANTH 1101 or consent of instructor. Learning to cope with cultural differences; contrasting value systems; cross-cultural and communication styles; nonverbal communication; cultural relativity; culture and perception; ethnocentricism; cultural shock. *(Yearly)*

ANTH 5121. Culture and Personality. (3) Prerequisite: ANTH 1101 or PSYC 1101 or consent of instructor. Anthropological contributions to theories of personality formation; data on tribal and national characteristics, patterns of childrearing, culturally derived aspects of human behavior, deviance and personal integration with the cultural milieu. *(Alternate years)*

ANTH 6112. American Indian Studies Through Curriculum Development. (3) Cultural descriptions of American Indians by culture area; contact relationships and policies; issues in contemporary Indian affairs presented through lectures, audio-visual materials, workshop activities and field trips. Emphasis on development of curriculum materials for elementary school teachers. *(Summer)*

ANTH 6132. Culture, Health and Aging. (3) Exploration of the interaction between culture and the aging experience, with a particular emphasis on issues of health and the health care system. *(On demand)*

EDUCATION

EDUC 5000. Topics in Education. (1-6) May include classroom and/or clinical experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

EDUC 6000. Topics in Education. (1-6) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

EDUC 6100. Theories of Human Development and Learning. (3) Concept of development; philosophical antecedents of developmental and learning theories; role of theory in explaining human nature; components of theoretical explanations; evaluating theories. *(Fall, Spring)*

EDUC 6102. The Person and School in Urban Society. (3) The basic philosophical theories and sociocultural forces that influence the objectives, structure and programs of schools, agencies and institutions in urban society. *(On demand)*

EDUC 6254. Individualizing Instruction for Diverse Learners. (3) Instructional modifications/adaptations related to meeting the individual learning needs of students. Emphasis on teaming, collaboration, and creating a classroom environment in which all learners can be successful. Differences among learners that are influenced by development, exceptionalities, and diversity are explored using case study methodology. *(Fall, Spring)*

EDUC 6274. Contexts and Issues in the Teaching of English. (4) Prerequisites: Admission to the Program. Examine the key concepts of the discipline. Consider own identities as readers, writers, teachers, researchers, makers of meaning. Emphasis upon critical approaches and pedagogical issues, with special attention to technology in the teaching of language, composition, and literature, as well as cultural contexts for the study of English. *(Fall) (Evenings)*

EDUC 6651. Piagetian Theory. (3) Prerequisite: Permission of the instructor. Advanced seminar for investigation of Piagetian theory with emphasis on genetic epistemology, research and neo-Piagetian concepts. *(On demand)*

EDUC 6674. Applied Research Methods in the Teaching of English. (4) Prerequisites: Completion of ENGL/EDUC 6274 and 12 hours of graduate credit toward this degree. Building on the research basis established in ENGL/EDUC 6274, this course provides the opportunity to apply research methods in classrooms. Examine identities as readers, writers, teachers, and especially as classroom researchers. *(Spring) (Evenings)*

EDUC 6974. Thesis/Project in the Teaching of English. (6) Research integrating the fields of English and Education in a theoretical or application-oriented study. It the thesis/project is the outgrowth of previous coursework, considerable additional research and exposition must be done.
Advanced Graduate Only

EDUC 7126. Comparative Education. (3) Analysis of sociocultural forces affecting educational planning and comparison of contemporary educational systems of selected countries and the United States. *(On demand)*

FINANCE

FINN 5158.Student Managed Investment Fund I. (3) Prerequisites: FINN 3120 or MBAD 6152, and FINN 3222 or FINN/MBAD 6153. Management of an actual portfolio consisting of a portion of the University's Endowment Fund. Admission is by permission of instructor. Students selected for the course are required to take FINN 5159. (Same as MBAD 5158.) *(Fall)*

FINN 5159. Student Managed Investment Fund II. (3) Prerequisites: FINN 3120 or MBAD 6152, and FINN 3222 or FINN/MBAD 6153. Management of an actual portfolio consisting of a portion of the University's Endowment Fund. Admission is by permission of instructor. Student cannot enroll in this course without successfully completing FINN 5158. (Same as MBAD 5159.) *(Spring)*

FINN 6151. Financial Institutions and Markets. (3) Major financial institutions, particularly commercial banks, and their role in the intermediation process and as suppliers of funds to the money and capital markets. Comparative financial policies of these institutions are examined in the context of their legal and market environment. (Same as MBAD 6151) *(Yearly)*

FINN 6152. Financial Management. (3) Prerequisite: MBAD 6131. Theory and practice of corporate finance including asset management, cost of capital and capital budgeting, optimization problems and socio-economic aspects of financial management. Computer technology may be employed when applicable. (Same as MBAD 6152) *(Fall, Spring)*

FINN 6153. Investment Management. (3) Prerequisite: MBAD 6152. Theory and practice of investment decisions of individuals and fund managers. Topics include the status of capital market theory, the efficient market hypothesis literature, and a portfolio performance measurement. Standard institutional and investment analysis topics, futures and options markets, and international investment topics are covered. (Same as MBAD 6153) *(Yearly)*

FINN 6154. Current Topics in Financial Management. (3) Prerequisite: MBAD 6152. Examination of business finance topics currently being discussed in the business media and development of advanced analytical skills in those topic areas. Topics will change depending upon the business environment. The following topics form the basis of the course; lease vs. buy (borrow); leveraged buy-outs; merger analysis; international operations of American firms (capital budgeting); and capital structure decisions. (Same as MBAD 6154) *(On demand)*

FINN 6155. Multinational Financial Management. (3) Prerequisites: MBAD 6111 and 6152. Financial management of the multinational firm including management of foreign exchange risk and political risk, and the control and evaluation of financial policies of multinational firms. (Same as MBAD 6155) *(Yearly)*

FINN 6156. Commercial Bank Management. (3) Prerequisite: MBAD 6152. Techniques for the

management of commercial banks. Topics of study include industry structure, administrative organization, management of assets, liabilities, and capital, and financial analysis of the banking firm. (Same as MBAD 6156) *(Yearly)*

FINN 6157. Theory of Corporate Finance. (3) Prerequisite: MBAD 6152. Theories of modern corporate finance, including theory of efficient capital markets; uncertainty and the theory of choice; market equilibrium asset pricing models (capital asset pricing model, arbitrage pricing theory, Black-Scholes); theories of capital structure and the cost of capital; dividend policy; and leasing. (Same as MBAD 6157) *(Yearly)*

Foreign Language

FORL 5050. Topics in Foreign Language. (3) Prerequisite: Senior standing or permission of the department. Studies in a selected field of interest. May be repeated for credit with change of topic. *(On demand)*

FORL 5200. Secondary Methods--Foreign Languages. (3) Prerequisite: Completion of at least two 3000-level courses or equivalent in the target language, or permission of the department. Current trends and practices in teaching foreign and second languages in the middle school and high school, with emphasis on practical applications. Addresses state-mandated competencies. Required for licensure in the teaching of foreign language and recommended for licensure in teaching English as a Second Language. *(Fall) (Evenings)*

FORL 5201. Foreign Languages in the Elementary School Methods. (3) Prerequisite: completion of at least two 3000-level courses or equivalent in the target language, or permission of the department. Current trends and practices in
teaching foreign and second languages in the elementary school, with emphasis on practical applications. Addresses state-mandated competencies. Required for licensure in the teaching of a foreign language and recommended for licensure in teaching English as a Second Language. *(Spring) (Evenings)*

FORL 5800. Directed Individual Study. (1-3) Prerequisite: permission of the department; normally open only to FL majors and minors. Individual work on a selected area of study. To be arranged with the instructor, generally during the preceding semester, and by special permission only. May be repeated for credit. *(On demand)*

French

FREN 5003. Studies in French Literature. (3) Prerequisite: FREN 3203, or permission of the department. Course may be repeated with change of topic. *(On demand)*

FREN 5005. Studies in the French Language. (3) Prerequisites: FREN 3201 and 3202, or permission of the department. Course may be repeated with change of topic. *(On demand)*

FREN 5007. Studies in French Culture and Civilization. (3) Prerequisites: FREN 3201, 3202, and 3209, or permission of the department. Course may be repeated with change of topic. *(On demand)*

FREN 5050. Topics in French. (1-3) Prerequisites: Junior standing; English 1102 or equivalent if taught in English. May be taught in French or English. Will not count toward the major. Course may be repeated with change of topic. *(On demand)*

FREN 5120. Advanced Business French I. (3) Prerequisites: FREN 2210, 3201 and an additional 3000- or 4000 -level course (3202 recommended), or permission of the department. Advanced studies in Business French, intensive practice in speaking, listening comprehension, reading, writing, and translation in functional business areas such as economics, management, and marketing. *(Fall)*

FREN 5121. Advanced Business French II. (3) Prerequisite: FREN 2210, 3201 and an additional 3000-or 4000-level course (3202 recommended), or permission of the department. Advanced studies in Business French, intensive practice in speaking , listening comprehension, reading, writing, and translation in functional business areas such as marketing, finance, and import-export. *(Spring)*

FREN 5201. Survey of French Literature I. (3) Prerequisite: FREN 3203. The major literary movements from the Middle Ages to the Enlightenment, with sample texts. Emphasis on continuity and change. *(Fall)*

FREN 5202. Survey of French Literature II. (3) Prerequisite: FREN 3203. The major literary movements from the Enlightenment to the contemporary period, with sample texts. Emphasis on continuity and change. *(Spring)*

FREN 5410. Professional Internship in French. (1-6) Prerequisites: FREN 3201 and 3202, or equivalent and consent of the department. Faculty-supervised field and/or research experience in a cooperating profession (e.g., business) or community organization. Contents of internship based upon a contractual agreement among the student, department, and business or community organization. Offered on a Pass/No Credit basis. *(Fall, Spring, Summer)*

FREN 5800. Directed Individual Study. (1-3) Prerequisite: permission of the department; normally

open only to FL majors and minors. Individual work on a selected area of study. To be arranged with the instructor, generally during the preceding semester, and by special permission only. May be repeated for credit. *(On demand)*

GERMAN

GERM 5010. Periods in the History of German Literature. (3) (a) Medieval literature, (b) Classicism, (c) Romanticism, (d) Nineteenth Century, (e) Contemporary literature. Prerequisites: two 3000-level courses or permission of the department. Study of the major writers and works in a given period. Readings, lectures and reports. May be repeated for major credit with change of topic. *(Alternate years)*

GERM 5020. The Chief Genres in German Literature. (3) (a) Novel, (b) Theater, (c) Lyric poetry, (d) short prose fiction. Prerequisites: two 3000-level courses or permission of the department. An analysis of a major genre and its development within German literary history. Readings, lectures and reports. May be repeated for major credit with change of topic. *(Alternate years)*

GERM 5050. Special Topics in German. (1-3) Prerequisite: one 3000-level course or permission of the instructor. Treatment of a special group or figure in German literature, specialized topic in German culture or language, or special problems in German conversation. May be repeated for credit with change of topic. *(Fall, Spring, Summer)*

GERM 5120. Advanced Business German I. (3) Prerequisites: GERM 2210, 3201 and an additional 3000- or 4000-level course (3202 recommended), or permission of the department. Advanced studies in Business German, intensive practice in speaking, listening comprehension, reading , writing, and translation in functional business areas such as economics, management, and marketing. *(Fall).*

GERM 5121. Advanced Business German II. (3) Prerequisite: GERM 2210, 3201 and an additional 3000- or 4000-level course (3202 recommended), or permission of the department. Advanced studies in Business German, intensive practice in speaking, listening comprehension, reading, writing, and translation in functional business areas such as marketing, finance, and import-export. *(Spring)*

GERM 5203. Survey of German Literature I. (3) Prerequisites: two 3000-level courses or permission of the department. General introduction to German literature from the Middle Ages to the Classical Period. Book reports and class discussion on collateral readings. *(On demand)*

GERM 5204. Survey of German Literature II. (3) Prerequisite: two 3000-level courses or permission of the department. German literature since Classicism. Book reports and discussions on collateral readings. *(On demand)*

GERM 5410. Professional Internship in German. (1-6) Prerequisites: GERM 3201 and 3202, or equivalent and consent of the department. Faculty-supervised field and/or research experience in a cooperating profession (e.g., business) or community organization. Contents of internship based upon a contractual agreement among the student, department, and business or community organization. Offered on a Pass/No Credit basis. *(Fall, Spring, Summer)*

GERM 5800. Directed Individual Study. (1-3) Prerequisite: permission of the department; normally open only to FL majors and minors. Individual work on a selected area study. To be arranged with the instructor, generally during the preceding semester, and by special permission only. May be repeated for credit. *(On demand)*

JAPANESE

JAPN 5410. Professional Internship in Japanese. (1-6) Prerequisites: JAPN 3201 and 3202, or equivalent and consent of the department. Faculty-supervised field and/or research experience in a cooperating profession (e.g., business) or community organization. Contents of internship based upon a contractual agreement among the student, department, and business or community organization. Offered on a Pass/No Credit basis. *(Fall, Spring, Summer)*

PHILOSOPHY

PHIL 5050. Topics in Philosophy. (3) Prerequisite: Consent of the department. In-depth treatment of selected problems and issues in philosophy. May be repeated for additional credit as topics vary. *(On Demand)*

PHIL 6050. Topics in Philosophy. (3) Prerequisite: Consent of the department. In-depth treatment of selected problems and issues in philosophy. May be repeated for additional credit as topics vary. *(On Demand)*

POLITICAL SCIENCE

POLS 5610. Challenges of Democracy. (3) Seminar on a current challenge to democratic practice in the United States to examine sources and consequences of the challenge and possible solutions. The topic changes from year to year. The class conducts a public forum on the challenge at the end of the semester. Graduate students are expected to prepare a research paper, lead the forum, and otherwise perform above the level of undergraduates. *(Fall)*

POLS 6000. Topics for Graduate Study in Political Science. (1-4) Intensive study of a topic in Political Science. The topic of investigation may vary from semester to semester. May be repeated for credit. (*On demand*)

POLS 6800. Independent Study. (1-3) Prerequisite: consent of the instructor. Supervised investigation of a political problem that is (1) of special interest to the student; (2) within the area of the instructor's special competence; and (3) normally an extension of previous coursework with the instructor. A student may take more than one course under this number but not more than three hours a semester. (*Fall, Spring, Summer*)

Religious Studies

RELS 5000 Topics in Religious Studies. (3) Prerequisite: consent of the instructor. May be repeated for credit. *(On demand)*

RELS 5010. Major Figure in Religious Studies. (3) The life and works of a major figure who has contributed to religious studies. May be repeated for credit for different figures. *(On demand)*

RELS 5101. Religion and Modern Thought. (3) The interaction of modern thought and modern religious sensibilities. (*Alternate years*)

RELS 5107. Early Judaism. (3) Prerequisite: RELS 2104 or 2105 or 3110 or consent of the instructor. Comparative historical and literary study of the varieties of Judaism evidenced during late antiquity (circa 70-640 CE), with special attention devoted to the information and development of rabbinic Judaism. *(On demand)*

RELS 5108. Medieval Judaism. (3) Prerequisite: RELS 2104 or 3110 or consent of the instructor. Comparative historical and literary study of the varieties of Judaism evidenced in Western Europe, the Byzantine Empire, and Islamicate realms from approximately 640 CE to approximately 1492 CE. *(On demand)*

RELS 5109. Modern Judaism. (3) Prerequisites: RELS 3110 or 4107 or 4108 or permission of the instructor. Historical and conceptual study of Judaism and Jewish experience in Europe, America, and Israel, from the 16th century to the present, with special attention paid to the development of denominations, Zionism, and the Holocaust. *(On demand)*

RELS 5110. Contemporary Jewish Thought. (3) An examination of philosophy, religion, morality, politics, sociality, culture, family, self-identity, in the light of modern and recent Jewish thought. *(Alternate years)*

RELS 5201. Religion, Culture and Morality. (3) Prerequisite: At least junior standing; one course in religious studies or ethics, or permission of the instructor. International/cross-cultural challenges and consequences of universal religious ethical systems versus religious relativism as the basis for moral theories and practices, including experiences and concerns of under-represented groups within religious moral systems. *(On demand)*

RELS 5204. Life-Study. (3) Prerequisites: Junior, senior or graduate standing. An appreciation of the religious dimension in a human life-history. Based on concepts, principles and methods developed by Ira Progoff for working within the life-history of a person who lived in a previous generation. *(Yearly) (Evenings)*

RELS 5205. Intensive Journal. (3) Prerequisites: Junior, senior or graduate standing. Study of religion and holistic depth psychology. Practical experience of the Intensive Journal method concentrates on the outer and creative dimension in a life including applications to personal, educational, and professional life. *(Alternate years) (Evenings)*

RELS 5215. The Artist as Visionary. (3) The role of visual imagination in the development of religious sensibilities. *(On demand)*

RELS 5216. Joseph Campbell. (3) Prerequisites: Junior, senior or graduate standing. A study of the life and works of Joseph Campbell (1904-1987) and the implications of his work for the study of religion. *(Alternate years)*

RELS 5218. Jung and Religion. (3) Prerequisites: Junior, senior or graduate standing. The works of C.G. Jung as they relate to an understanding of religion and religious experience. Emphasis on his interpretations of myths and symbols as they appear in both Western and non-Western religions. His theories of creativity and the arts, religious expressions and quests for meaning. *(Yearly)*

RELS 6000. Topics in Religious Studies. (1-3) Prerequisites and credit hours vary with topics. Advanced topics in Religious Studies. May be repeated for credit as topics vary. *(On demand)*

RELS 6800. Directed Studies. (3) Prerequisite: consent of the instructor. May be repeated for credit. (*Fall, Spring*)

Research

RSCH 6101. Educational Research Methods. (3) Empirical, logical and conceptual research problems; methods and procedures of research; interpreting research; writing reviews of related literature; library research. *(Fall, Spring, Summer)*

RSCH 6109. Assessment and Evaluation Methods. (3) Assessment of performance and ability through the selection, administration, and interpretation of

standardized and criterion-referenced assessment instruments and mastering of other competencies prescribed by the State of North Carolina and other professional organizational standards. *(Fall, Spring, Summer)*

RSCH 6110. Descriptive and Inferential Statistics in Education. (3) Prerequisite: RSCH 6101 or equivalent. Objective decision-making in research; inferential methods; elementary parametric and non-parametric techniques in hypothesis testing, data processing through University computer facilities. *(Fall)*

RSCH 6120. Advanced Educational Statistics. (3) Prerequisite: RSCH 6110. Advanced topics in probability and statistics as a basis for objective decision-making educational research: multiple correlation and regression, one-way and n-way analysis of variance and covariance, advanced ANOVA designs, advanced nonparametric methods, introduction to multivariate statistical procedures. Emphasis on understanding concepts through analyses of prepared data. *(Spring) (Evenings)*

RSCH 6130. Presentation and Computer Analysis of Educational Data. (3) Prerequisite: RSCH 6110. Fundamentals of data presentation and analysis using computer-based statistical procedures (e.g., SPSS, SYSTAT, BMDP, SAS); basic descriptive statistics, correlational and associational measures, and inferential statistics emphasized in a series of analyses of prepared data; graphic presentation and interpretation of data sets. *(Fall, Spring) (Evenings)*

Advanced Graduate Only
RSCH 8110. Descriptive and Inferential Statistics in Education. (3) See course description for RSCH 6110.

RSCH 8120. Multivariate Statistics. (3) See course description for RSCH 7120.

RSCH 8211. Qualitative Research Methods in Education. (3) Prerequisite: RSCH 6101 or equivalent. Qualitative research methods in education, including historical, philosophical, biographical, ethnographic, and case study; location of sources, methods of data collection and analysis, field techniques, writing research results. *(Fall) (Evenings) (Alternate Years)*

RSCH 8212. Survey Research Methods in Education. (3) Prerequisite: RSCH 6101 and 6110. Techniques of survey research: ethical issues, proposal development, direct and indirect methods, sampling, analysis and presentation of survey data, writing survey research reports, application to educational program evaluation. *(Fall) (Evenings) (Alternate Years)*

RSCH 8213. Single-Subject Research Methods in Education. (3) Prerequisite: RSCH 6101 and 6110. In-depth study of single-subject research methods, including data collection, research designs, data display and analysis, and writing research reports. *(Spring) (Evenings) (Alternate Years)*

RSCH 8140. Multivariate Statistics. (3) Prerequisite: RSCH 6110 or equivalent. Multiple regression; factor analysis applied to descriptive, correlational and experimental research. *(Fall)*

RSCH 8296. Program Evaluation Research Methods in Education. (3) Examination of strategies and techniques of program evaluation with emphasis on the mastery of skills for utilization of selected procedures for analyzing teaching/ learning processes. *(Spring)*

RSCH 8210. Applied Research. (3) Development and implementation of proposals for research; use of designs for research and statistical procedures as required by research plans of graduate students. *(Summer)*

SPANISH

SPAN 5050. Selected Topics in Spanish. (1-3) Prerequisites: two 3000-level courses or permission of the department. Consideration of a predetermined topic. May be repeated for credit as topics vary. *(On demand)*

SPAN 5120. Advanced Business Spanish I. (3) Prerequisites: SPAN 2210, 3201 and an additional 3000- or 4000-level course (3202 recommended), or permission of the department. Advanced studies in Business Spanish, intensive practice in speaking, listening comprehension, reading, writing, and translation in functional business areas such as economics, management, and marketing. *(Fall)*

SPAN 5121. Advanced Business Spanish II. (3) Prerequisites: SPAN 2210, 3201 and an additional 3000- or 4000-level course (3202 recommended), or permission of the department. Advanced studies in Business Spanish, intensive practice in speaking, listening comprehension, reading, writing, and translation in functional business areas such as marketing, finance, and import-export. *(Spring)*

SPAN 5201. Nineteenth-Century Spanish Literature. (3) Prerequisites: two 3000-level courses or permission of the department. Survey of peninsular literature from Costumbrismo through the Generation of 1898. Lectures, discussions, and reports. *(Alternate years)*

SPAN 5202. Twentieth-Century Spanish Literature. (3) Prerequisites: two 3000-level courses or permission of the department. Treatment of major literary developments from the Generation of 1898 to present day. Lectures, discussions, and reports. *(Alternate years)*

SPAN 5205. Novel of the Golden Age. (3) Prerequisites: two 3000-level courses or permission of the

department. *El Lazarillo* through *El Criticón*. Lectures, discussions, and reports. *(Alternate years)*

SPAN 5206. Theater of the Golden Age. (3) Prerequisites: two 3000-level courses or permission of the department. Study of works of the leading dramatists of the period. Lectures, discussions and reports. *(Alternate years)*

SPAN 5210. Studies in Spanish American Poetry. (3) Prerequisites: two 3000-level courses or permission of the department. Studies of 19th- and 20th-century Spanish American poetry. *(Alternate years)*

SPAN 5211. Studies in Spanish American Prose Fiction. (3) Prerequisites: two 3000-level courses or permission of the department. Studies of 19th- and 20th-century Spanish American prose fiction. *(Alternate years)*

SPAN 5212. Studies in Spanish American Theater. (3) Prerequisites: two 3000-level courses or permission of the department. Studies of 20th-century Spanish American theater. *(On demand)*

SPAN 5213. Don Quijote. (3) Prerequisites: two 3000-level Spanish courses or permission of the department. Study of Cervantes' masterpiece. *(On demand)*

SPAN 5410. Professional Internship in Spanish. (1-6) Prerequisites: SPAN 3201 and 3202, or equivalent and consent of the department. Faculty-supervised field and/or research experience in a cooperating profession (e.g. business) or community organization. Contents of internship based upon a contractual agreement among the student, department, and business or community organization. Offered on a Pass/No Credit basis. *(Fall, Spring, Summer)*

SPAN 5800. Directed Individual Study. (1-3) Prerequisite: permission of the department; normally open only to FL majors and minors. Individual work on a selected area of study. To be arranged with the instructor, generally during the preceding semester. By special permission only. May be repeated for credit. *(On demand)*

STATISTICS

STAT 5123. Applied Statistics I. (3) Prerequisites: MATH 2164 with a grade of C or better and junior standing, or consent of department. Review of stochastic variables and probability distributions, methods of estimating a parameter, hypothesis testing, confidence intervals, contingency tables. Linear and multiple regression, time series analysis. *(Fall) (Evenings) (Alternate years)*

STAT 5124. Applied Statistics II. (3) Prerequisite: STAT 5123 or consent of the department. One way analysis of variance. Multiway classification. Randomized complete-block designs, nested or hierarchical designs, Latin squares, factorial experiments. Design of experiments. *(Spring) (Evenings) (Alternate years)*

STAT 5126. Theory of Statistics I. (3) Prerequisite: STAT 3123 or consent of the department. Survey of the mathematical structure supporting applied statistics. Discrete and continuous distributions, moment-generating functions, sampling, point estimation, the multivariate normal distribution, sampling distributions. *(Fall) (Alternate years)*

STAT 5127. Theory of Statistics II. (3) Prerequisite: STAT 5126 or consent of the department. Point and interval estimations, hypothesis testing, regression and linear hypotheses, experimental designs and analysis, distribution-free methods. *(Spring) (Alternate years)*

STAT 7027. Topics in Statistics. (3) Prerequisite: consent of the department. Topics of current interest in statistics and/or applied statistics. May be repeated for credit with consent of the department. *(On demand)*

STAT 7122. Advanced Statistics I. (3) Prerequisite: MATH 7143 and STAT 5127 or consent of department. A survey of frequently used statistical techniques selected from: estimation theory and hypothesis testing, parametric goodness-of-fit criterion and tests for independence, measures of association, regression techniques, multi-sample inferential techniques, Bayes and minimax estimation, admissibility, minimax property. *(On demand)*

STAT 7123. Advanced Statistics II. (3) Prerequisites: STAT 7122 or consent of the department. Hypothesis testing, Neyman-Pearson Lemma, UMP tests, UMP unbiased tests, monotone likelihood ratio families of distributions, UMP invariant tests. Confidence bounds and regions, uniformly most accurate bounds, regression models, least squares estimates, normal equations, Gaiss-Markov theorem. Large sample behavior of methods of moments estimates, maximum likelihood estimates, likelihood ratio tests, Chi-square tests, approximate confidence regions for large samples. *(On demand)*

STAT 7124. Sampling Theory. (3) Prerequisite: STAT 5126 or consent of the department. Methods and theory of survey sampling: simple, systematic, stratified, cluster multistage and specialized sampling schemes and the problems of their implementation and analysis. *(On demand)*

STAT 7127. Linear Statistical Models. (3) Prerequisites: MATH 2164 and 3123 or consent of the department. A selection of topics from the following list: distribution and quadratic forms, regression, dummy variables, models not of full rank, the two-way crossed classification, time series. *(Fall) (Alternate years)*

STAT 7133. Multivariate Analysis. (3) Prerequisite: STAT 5126 and 5127 or consent of the department. Multivariate distributions. Inference for the multivariate normal model. Further topics from the following: principal components, factor analysis, multidimensional scaling, canonical correlation, discriminant analysis, cluster analysis, multivariate linear models, special topics. *(Fall) (Alternate years)*

STAT 8027. Topics in Statistics. (3) See STAT 7027 for Course Description.

STAT 8122. Advanced Statistics I. (3) See STAT 7122 for Course Description.

STAT 8123. Advanced Statistics II. (3) See STAT 7123 for Course Description.

STAT 8124. Sampling Theory. (3) See STAT 7124 for Course Description.

STAT 8127. Linear Statistical Models. (3) See STAT 7127 for Course Description.

STAT 8133. Multivariate Analysis. (3) See STAT 7133 for Course Description.

WOMEN'S STUDIES

WMST 5050. Topics in Women's Studies. (1-3) Prerequisites and credit hours vary with topics. Special topics in Women's Studies. May be repeated for credit as topics vary. *(On demand)*

WMST 6050. Topics in Women's Studies. (1-3) Prerequisites and credit hours vary with topics. Special topics in Women's Studies. May be repeated for credit as topics vary. *(On demand)*

WMST 6800. Directed Reading/Research. (3) Prerequisites: prior written permission of instructor and Women's Studies Coordinator. Independent investigation of a problem or a topic in Women's Studies, culminating in a research paper or a final report. Student must provide a written plan of work before registering for the course. May be repeated for credit. *(On demand)*

PROGRAMS, SERVICES and FACILTIES

The Campus

The UNC Charlotte campus is located off Harris Boulevard on NC 49 near its intersection with US 29, and only eight miles from the interchange of Interstates 85 and 77. Campus facilities are comprised of air-conditioned contemporary buildings. In addition to classrooms and well-equipped laboratories, the University offers arts and athletic facilities, cafeterias and residence accommodations. The campus is designed for the pedestrian and facilities are generally accessible to students with disabilities.

A map of the campus is included in the back of this *Catalog*. The Kennedy Building houses the Graduate Admissions Office and Graduate School. The Reese Building houses many administrative offices, including the Registrar's Office and Student Accounts.

EDUCATIONAL SERVICES and FACILITIES

Adult Students and Evening Services (OASES)

Comprehensive student assistance is available after 5 p.m. Monday through Thursday. Evening students may consult with an academic advisor *on general education goals*,, pick up forms, publications, and make payments in OASES. Payments can be made by check, money order, or credit card (no cash) for tuition, applications, transcript requests, and other required fees. The Web Student View System is available, and well-trained staff members provide current, accurate information.

OASES assists adult students in making a successful transition to UNC Charlotte. Undergraduate orientation sessions, information about the Non-Traditional Student Organization (NTSO), and student newsletters are available to adult students through this office. In addition, private scholarships are awarded to adult students by the OASES program.

Office hours are Monday-Thursday, 8:00 a.m. - 8:00 p.m. (7:00 p.m. during the summer), Friday, 8:00 a.m. - 5:00 p.m., and Saturday 9:00 a.m. - 3:00 p.m. The office closes daily at 5:00 p.m. when classes are not in session. Check with the office for any special closings (typically during University holidays and breaks) each semester. OASES can be contacted at: 106 Barnard Building, (704) 547-2596, http://www.uncc.edu/OASES.

Computing Services

Computing Services provides the University's infrastructure to support instructional, research, and administrative computing. The campus has a robust data network. All student computing labs and offices have full access to the Internet. All students, faculty, and staff have an electronic mail account and, if desired, a web page account. There are over 42 student computing labs with a total of over 860 stations. Many computing labs have specialized software and hardware. The University's major systems, such as the library and electronic mail systems, are accessible from off campus using an Internet Service Provider. The University is a member of the North Carolina Research and Education Network, which provides access to the North Carolina Supercomputer Center and other state resources.

Disability Services

Disability Services assists students with academic and physical accommodations based on documentation of disability. Services include, but are not limited to: 1) priority registration assistance; 2) orientation to available services; 3) development of individualized educational plans; 4) special testing accommodations; 5) taped textbooks, Braille and/or large print service for visually impaired students; 6) assistive technology loans; 7) referrals to tutoring and other campus support services; and 8) interpreting services for students who are deaf; 9) individual counseling and advocacy; and 10) referrals to human services agencies.

In all possible cases, UNC Charlotte will obtain educational auxiliary aids from existing resources such as Vocational Rehabilitation agencies and private charitable organizations. The University assumes no responsibility for the provision of attendants, individually prescribed devices, readers for personal use, or any devices or services of a personal nature. The arrangements for these services are entirely the responsibility of the student. The Disability Services Office also serves as a resource to faculty, staff, and the University community by providing consultation and advocacy services on issues related to compliance with the Americans with Disabilities Act of 1990.

International Programs

The Office of International Programs (OIP) offers academic and cultural programs to enhance the learning environment of the University community.

International Admissions

International Admissions (IA) is responsible for marketing UNC Charlotte to the world. The primary focus is to recruit international students who will attend UNC Charlotte on non-immigrant visas. When students apply, IA processes the applications, evaluates credentials and makes admission decisions on undergraduate applicants. At the graduate level, IA processes applications, evaluates credentials, and serves as a consultant to the Graduate School and the graduate

departments. Once admitted, student files are referred to International Student/Scholar Services for processing of documents needed to obtain student and exchange visas.

Education Abroad
UNC Charlotte encourages its students to study and live in a foreign country as a part of their undergraduate career. The Office of Education Abroad offers students the opportunity to study or work abroad for a year, a semester or a summer. Programs are available in countries virtually all over the world. Deadlines for application for fall semester or year-long programs are in January, deadlines for spring semester programs are in September or October, and deadlines for summer programs are generally in March or April. Contact the Office for program information.

Faculty Development
The Office of International Programs serves as a facilitator for faculty exchange opportunities. Faculty are encouraged to work with the OIP staff in exploring and applying for a wide range of international exchanges. Among those are the Fulbright Exchange Program, reciprocal department exchanges, and exchanges based on agreements between UNC Charlotte and overseas institutions of higher learning. Faculty and administrators also are able to take advantage of OIP's professional development program. This program provides opportunities for the further enhancement of international interests through travel for international study and research and faculty colloquia on international topics.

International Student/Scholar Services
These services are designed to address the needs of foreign students and scholars in the areas of immigration, language, campus orientation and cultural understanding. In addition, the staff serves as a liaison to other campus offices on related matters and provides programs that enhance the student and scholar's learning experience including Conversation Partners, The Host Family Program, advising of international student clubs, and Cross-Cultural Training Workshops.

Campus Programming
Various events are sponsored independently and in cooperation with other departments and agencies. They include the annual International Festival, dinners featuring specific cultures, the Education Abroad Fair, Summer Institutes, and the Chapter office of Phi Beta Delta Honor Society for International Scholars.

The English Language Training Institute (ELTI)
The Institute provides intensive English as a Second Language instruction for international students planning to attend American universities or colleges and for individuals pursuing professional training in the United States. ELTI holds three sessions per year--fall, spring, and summer--and offers eight language proficiency levels, including a level for applicants for graduate study. Average class size is 12 students and students attend classes 20-24 hours per week. Exceptional students in Levels 6 and 7 are eligible to take University courses in addition to their English classes. ELTI also offers a communications course for international teaching assistants, consulting for international faculty at UNC Charlotte, short-term programs with English language and American culture themes, and curricula custom-designed for professional groups.

Public Service
The OIP seeks to initiate and respond to the international needs and interests of the community. Current programs include: 1) Community Forums - symposia on topics of current international interest; 2) Great Decisions - an annual series of lecture/discussions during the months of February and March on eight key policy issues; 3) Cross-Cultural training - individually designed workshops that focus on appreciation for other cultures and development of skills in effective communications across cultures; 4) Intercultural Outreach Programs - offers custom designed, short term training programs for international groups. These programs may include English language training, American cultural themes, and/or specialized professional development in any field, site visits and internships in the community, and a variety of cultural experiences tailored to meet the objectives of the group. Examples of recent groups include Korean university, Japanese and Taiwanese English teachers, Russian social studies teachers, Japanese bankers and business people, Korean telecommunications executives, and Korean government officials; and 5) Japan-America Society - a university-community joint venture to enhance understanding of Japan and U.S.-Japan relations.

Learning Center
Designed to improve academic performance and foster meaningful learning experiences, the Learning Center provides services, programs, and materials to help students develop and refine thinking skills, utilize learning and self-management skills, and learn course material more quickly and thoroughly while earning higher grades. Services include: 1) individual consultation and academic counseling regarding learning and self-management skills; 2) assessment of reading/learning skills, learning styles, and study habits/attitudes; 3) computer-assisted instruction for a variety of course subjects; 4) learning and self-management skills workshops; 5) a library of materials with books, audio tapes, video tapes, and printed handouts outlining study/learning strategies; and 6) materials available for the GRE, GMAT, LSAT and other standardized tests.

Library
The J. Murrey Atkins Library is located near the center of the campus and houses an open-shelf collection that includes over 664,023 bound volumes and more than 660,000 units in microform. The Library of Congress classification system is used for the arrangement of books

and periodicals, and an online catalog provides access to a substantial portion of the collection.

Atkins Library meets the informational needs of the University community by offering a variety of services. Library staff provide assistance to users in locating information and in use of the library. The library offers general orientation tours during the fall semester. The reference staff offers an active library instruction program, which includes customized presentations and resource guides and instruction sheets on locating and using library resources.

The Library offers state-of-the-art electronic access to local and worldwide resources. JASMINE, the Library's online catalog, provides access to a complete range of print and non-print resources located within the Library. Networked multitasking computers with high speed printing and download capabilities provide electronic access to local research databases, electronic journals, full-text articles, and Internet connections to the world including NC Live, the North Carolina electronic initiative with access to thousands of databases. Web based access to Library electronic research materials is also available from University computer labs all over campus.

A number of special collections are available. A selective depository of U.S. publications since 1964, Atkins Library has over 884,000 federal government documents including statistics, bibliographies and full text files on over 2,300 compact discs. The North Carolina documents collection, begun in 1976, is a rapidly growing collection of publications of state government agencies; the library was designated one of the first depositories for North Carolina documents in 1988. The Local Public Documents Room Collection for the McGuire Nuclear Plant on Lake Norman is located in the Library. Atkins Library also houses a growing collection of over 48,000 maps, ranging from USGS topographic quadrangles to historic WWII-era Defense Mapping Agency maps.

The Mary and Harry L. Dalton Rare Book and Manuscript Room houses collections of rare books, historical manuscripts, local government documents, and official University records. The 6200 volume Rare Book Collection specializes in American literature, historical children's books, and English drama. The Manuscript Collections contain over one million unpublished papers, photographs, and architectural drawings relating to the history of Charlotte-Mecklenburg and surrounding counties, while the Local Documents Collection emphasizes printed materials issued by governmental bodies in the region. The University Archives and Records Management Program provides information support services for current University operations and preserves approximately one million items that document the history of the university.

The Curriculum and Instructional Materials Center provides a laboratory for students and faculty to study and experiment with curriculum and instructional materials and methods. Included in the Center are over 5,000 elementary and secondary textbooks, a file of standardized tests, computer laboratory with software and laser technology, a collection of professional education books, pamphlets and periodicals, curriculum guides from school systems throughout the country, and numerous other resources for the teacher education profession. The Center staff also provides customized library instruction and resource guides for class assignments. The Center also serves as the North Carolina National Aeronautical and Space Administration (NASA) Regional Teacher Resource Center.

Media Services

Media Services are administered by the Library, is located in the Atkins building. It offers a wide range of traditional audio-visual services, as well as support for emerging technologies to faculty and students for instructional purposes. The production staff is capable of producing color slides (both traditional and computer output), high quality color laser printing, black and white photographs, professional quality audio and video recordings, satellite downlinks and multimedia programs.

Faculty may develop multimedia projects utilizing the hardware and software applications available in the unit's multimedia resource lab. The lab is equipped with networked Macintosh and Gateway computers, scanners, printers, illustration, presentation and authoring software programs. The lab also houses an extensive collection of copyright-free clip art and CD-ROMS.

Media Services lends audio-visual equipment for short-term use to students and faculty. Equipment includes VCR's and monitors, camcorders, projectors (data, video, document, filmstrip, motion picture, opaque, slide and overhead), audio tape recorders, public address systems, record and compact disc players, laser disc players, easels, tripods and screens. The unit also oversees equipment that is permanently installed in teaching classrooms across campus.

The unit manages a television studio and teleconference and teleclassroom facilities as part of two highly sophisticated, fully interactive video networks in conjunction with the Microelectronics Center of North Carolina, and the North Carolina Information Highway. Professional assistance is available upon request. Additional services provided by the unit include: digital imaging services, video and audio duplication, international video tape conversion, video tape editing (both analog and digital), slide duplication, copystand work, dry mounting, and laminating. The staff offers assistance in equipment operation, and provides consulting and assistance for multimedia, web page and graphic design, and instructional design and development.

Hours are:

Monday-Thursday	7:45 a.m. - 12:00 midnight
Friday	7:45 a.m. - 8:00 p.m.
Saturday	10:00 a.m. - 8:00 p.m.
Sunday	1:00 p.m. - 12:00 midnight

Hours may vary during holidays and final exam periods. Note that the Atkins Library is currently undergoing the construction of a sizeable addition that will meet the library and research needs of students to come. The Reference Desk is an excellent resource to obtain information about the location of library items throughout the construction phase. Call the Telelibrarian, 547-2140, for general library information and current hours and the Information Desk, 547-2392, for other library-related queries.

Research Services

The Office of Research Services is headed by the Associate Vice Chancellor for Research and provides services to the University community in support of research and creative activity. The staff is available to consult with faculty and to assist in all phases of developing research programs, seeking and securing funding, and managing projects, including identification of funding sources, interpretation of guidelines, preparation of budgets, and general consultation on writing and funding strategies. The Office of Research Services maintains extensive web resources, coordinates research support efforts with college research officers, and is responsible for federal and congressional relations, federal compliance, and operation of the University Vivarium.

Student Employment Office

The Student Employment Office assists students in locating work on campus. The University participates in the federal Work-Study Program and attempts to match students with jobs related to their academic interests. Students are encouraged to limit employment hours to allow for success in a full 15-18 hour course load each semester. The Office is located at 101 King Building.

University Career Center

The University Career Center is a comprehensive career service that has received national recognition for "state-of-the-art" programs and services. The University Career center's design is to assist students in all stages of career development: career decision making, career planning, and career employment/placement. Experiential learning is one of the key components of career exploration. Many graduate programs require these experiences, while the University Career Center can help arrange other non-credit 49ership experiences in the student's field of interest.

The Job Location and Development (JLD) Program assists students in obtaining part-time off-campus employment. Job listings and assistance are available with over 10,000 position vacancies listed along with links to recommended job search websites.

Services provided by the Center range from individual counseling on career transitions/changes, job search consultation and videotaped mock interviews to small group workshops on resume writing, interviewing techniques, uncovering the hidden job market, and transition to the world of work. Other services include on campus interviewing, a career resource collection, seven job and career exploration fairs, special career programs and the Experiential Learning Programs. Students are encouraged to visit the University Career Center during their first semester at UNC Charlotte.

The University Career Center maintains relations with over 1,100 area and national employers for job fairs, recruiting, consultations and other means to connect with potential candidates. Over 12,300 resumes are referred to over 2,500 employers through the University Career Center each year. The office also utilizes technology for service delivery and on-line registration for the On-Campus Interview and Experiential Learning Programs. The University Career Center can be located at: 132 King Building, (704) 547-2231, (Web) www.uncc.edu/career, (E-mail) career@email.uncc.edu.

University Writing Programs

The University Writing Programs consist of three units: 1) the University Writing Programs (UWP), 2) the Writing Resources center (WRC), and 3) the UNC Charlotte Writing Project (WP). As one of the primary responsibilities, the Director of UWP provides faculty development opportunities such as faculty and classroom workshops, an annual retreat at Wildacres, curriculum-specific work with departments, and individual consulting.

The UWP and the WRC work in tandem to provide services, programs, materials, and academic support for both students and faculty in order to improve students' writing skills and faculty writing pedagogy. The WP indirectly supports these efforts by working with K-12 teachers to influence their students' writing skills and their teacher's writing pedagogy. Both the UWP and the WRC support student support services by working with the University Learning Center, Disability Services and several other university departments.

Writing Resources Center

The Writing Resources Center (WRC) provides a free tutorial service for all UNC Charlotte students who want to become more effective writers. Students who come to he center work one-on-one with graduate and undergraduate tutors on any part of the writing process--planning drafting, focusing, organizing, revising, or editing. Tutors help students understand their writing processes and learn strategies for writing successful papers at all levels and for all disciplines. WRC services include one-on-one tutoring, small group tutoring,

student referrals, classroom workshops, small group workshops, library assistance, and on-line tutoring. Computer-assisted grammar instruction, handbooks and professional writing texts, and a limited number of PC's are available for student use in writing papers.

STUDENT AFFAIRS and SERVICES

The University of North Carolina at Charlotte provides a comfortable and enjoyable environment for students that is conducive to study. The services, facilities, and programs of the University promote individual student development and foster a community which promotes the involvement of students in their intellectual, cultural, spiritual, emotional, and physical development.

Bonnie E. Cone University Center

Cone Center serves as the hub of activity for informal gatherings and social and educational activities on campus and provides an attractive, comfortable place for relaxation and study. Services and facilities include a variety of meeting rooms and multi-purpose spaces, art galleries, an information desk and music listening lounge, TV/Video Lounge, the Candy Shoppe/Ticket Counter, Creation Station (signs, banners, balloons, etc.), 24-Hour Program Hotline, Campus Event Information Office, and Technical Services. A variety of activities, including concerts, movies, lectures, banquets are provided.

Also located within Cone University Center are the offices of the Student Body Government, the Graduate and Professional Student Government, University Times, Sanskrit, Student Media Marketing, Black Student Union, University Program Board, Resident Student Association, Venture Program, Office of Student Activities, Multicultural Center, Student Activity Fees Clerk, I.D. Office, Food Services and Conferences, Reservations and Event Services (located in the administrative offices of the University Center).

After Hours and The Rathskeller

After Hours (Cone Center) and The Rathskeller (Residence Hall Cafeteria) can be reserved for dances and other events. The University Program Board (UPB) and Campus Programs offer a wide variety of entertainment including name musical and novelty acts, lectures, movies, minority programs, women's programs and children's programs.

Counseling Center

The Counseling Center provides services and programs that include personal counseling, career development, group counseling and testing.

The Center is staffed by psychologists and counselors who provide counseling designed to meet individual needs. Personal counseling helps each person address concerns that might include relationship problems, stress, anxiety, depression and a wide range of issues that can affect academic success. Information between students and their counselors is confidential in accordance with guidelines established by the American Psychological Association.

Career counseling guides students through career development decisions using methods including the exploration of personal interests, work values and abilities. This process utilizes resources such as individual counseling sessions, career exploration groups, the Career Resource Library, and use of the SIGI Plus computer-assisted career guidance system. The administration of career interest inventories, personality surveys and achievement tests provide an additional method of self-exploration for students.

Groups are offered each semester to teach a skill or focus on a particular theme. They are designed to address specific needs and focus on themes such as relationship issues, stress management, personal growth and career development. Therapy groups and discussion groups are also available.

Outreach and consultations are vital functions of the Counseling Center. Staff members are available to consult with faculty, staff and student organizations on topics such as enhancing communication, improving the learning environment and helping the problem student. Outreach activities are conducted outside the Counseling Center to meet the needs of groups and organizations. This includes training tailored to specific topics and programs geared toward student interests. The staff is also available to consult with Teaching Assistants who would like some advice in responding to student needs in the classroom. The Counseling Center can be contacted at: 158 Atkins Building, appointments can be made by coming to the Center or calling (704) 547-2105, http://www.uncc.edu/counseling_center/

Dean of Students Office

The Dean of Students Office is a department within the Division of Student Affairs and serves as a key link between students and other areas of campus and academic life. Various activities are sponsored by the Dean of Students Office to promote opportunities for learning and growth throughout a student's college experience. The staff is responsible for advising and promoting the following programs: student government, fraternities and sororities, minority student support services, new student orientation, commuter life, women's programs, student discipline, intramural and recreational services and volunteer services.

Staff services are available to all students. The staff of student development professionals provides support for students who have grievances or concerns about the University, students in crisis, and students experiencing

medical emergencies. The office also coordinates and assists with the settlement of academic and social misconduct charges against individuals and student organizations. The Dean of Students Office can be contacted at: 217 King Building, (704) 547-2375.

Health Center

The Brocker Health Center provides a range of outpatient medical care to all University students. In addition to basic services, the Health Center houses a pharmacy, medical facilities for laboratory, X-rays and allergy injections, and a physical therapy department. Other services include specialized clinics for orthopedics, gynecology, podiatry and HIV screening.
Brocker Health Center is fully operational between the hours of 8:00 a.m. and 5:00 p.m., with physicians and support staff on duty Monday through Friday. Appointments are needed. The Health Center is operational during both semesters as well as all summer sessions.

Seriously ill students and emergencies are referred to local hospitals or their appropriate medical facilities. In all cases, fees for such services are the responsibility of the student rather than the University. Students are urged to review their insurance plans to be sure they have adequate coverage for emergency treatment or hospitalization. The University does not provide health insurance for students. For the convenience of students, information pertaining to private insurance coverage is available at the Health Center or Auxiliary Services.

Students coming to the Health Center must present their current University identification card. The Student Health Fee covers most of the cost for services at the Health Center, however, additional fees are changed for X-ray, pharmacy, laboratory and orthopedic services. Fees are subject to change. The Brocker Health Center is located on the southwestern quadrant of the campus, between the Belk Gym and Hunt Village apartments. The center can be contact at: 547-4617 (general information), 547-4618 (appointments), http://www.uncc.edu/health_svcs

Housing and Residence Life

The Department of Housing and Residence Life offers students a variety of living arrangements including Graduate/Nontraditional Student Housing in recently renovated apartments. Renovated in the summer of 1999, Hunt Village offers a quiet area that is conducive to the lifestyle of graduate students. Hunt Village apartments have four one-person bedrooms, a bath, living/dining area and kitchen. Kitchens include stoves and full-size refrigerators.

Apartment furnishings include a single bed, under-the-bed dresser, desk, chair, and cable TV/high speed Internet connections for each bedroom. Living areas include a couch and dining table and chairs. All apartments have window blinds and are air-conditioned. Other amenities include basic cable television, the Miner Movie channel featuring current movie titles and Time Warner's "Road Runner" high-speed cable modem Internet service. Local telephone service, which includes voice mail, is provided to all residents. Students contract independently for electrical service. Several options are also available for summer housing. For information, contact the Department of Housing and Residence Life.

Students who plan to live on campus should apply as soon as possible as space is limited. An application for housing will be sent to the entering student who requests one following his or her final admission to the University. A $100 deposit is required when the application is returned to the Associate Vice Chancellor and Director of Housing and Residence Life.

Housing facilities designed specifically for students in wheelchairs are available. Wheelchair students who receive confirmation of residential space have priority in assignment to these facilities *as long as the University is able to offer space.* It is extremely important that the housing application is received before all space is committed so that this priority for assignment to appropriate facilities can be exercised. Wheelchair students may be considered for priority status on the waiting list on the basis of 1) the date of application and 2) the degree of utilization of wheelchair-equipped facilities as compared to the proportion of wheelchair students who apply.

Assignment to a wheelchair-accessible housing space, requires documentation of the disability and special needs in accommodations by the Disability Services Office. Documentation must be provided to Disability Services when the housing application is submitted and no later than June 1.

The University does not assume any responsibility for the provision of attendants for students with disabilities. Such arrangements are entirely the responsibility of the individual student and should be established well in advance of the time the services are to begin. Housing and Residence Life can be contacted at: Scott Hall, (704) 547-2585, http://www.uncc.edu/housing, (E-mail) Housing@email.uncc.edu

Religious Affairs

As a tax-supported public institution, UNC Charlotte neither promotes nor recommends any religious orientation. However, the University recognizes that spiritual discernment and moral appreciation are essential to the development of the whole personality and has established an Office of Religious Affairs headed by a director.

The functions of this office include providing information to the campus community and general public about religious activities and programming as well as coordinating the activities of religious organizations in the University. These organizations provide a variety of

services including prayer, pastoral and academic counseling, retreats, Bible study, marriage preparation, discussion groups, ecumenical activities, and social services. Faculty members, staff and students may obtain additional information by contacting the Office of Religious Affairs.

The religious associations listed below provide the services of their representatives to serve the spiritual needs of students and other members of the campus community.

Baptist
Catholic
Episcopal
Lutheran
Methodist
Presbyterian

These persons and other representatives can be contacted at: Office of Religious Affairs, 200 King Building, (704) 547-2344.

STUDENT ACTIVITIES

The Student Government Association, the University Program Board, and Student Media are a few of the available activities which can play a significant role in each student's development and total education. Participation in activities, ranging in type from service and religious to athletic and social, and from creative arts and crafts to wilderness experiences, increases a student's opportunities to acquire leadership skills, to experience the responsibilities involved in functioning within a self-governmental process, and to develop personal talents and interests. Over 130 student groups are active to meet a wide variety of student interests.

Athletics

The UNC Charlotte Department of Athletics provides competition in 16 intercollegiate varsity sports for men and women. Each sport competes under the governing powers of the National Collegiate Athletic Association (NCAA) at the Division I level, which is the highest competitive level for collegiate varsity sports. UNC Charlotte is a member of the Conference USA offering sports in the following areas: Men-baseball, basketball, cross-country, golf, soccer, tennis, indoor track and field, and outdoor track and field; Women-basketball, cross-country, soccer, softball, tennis, volleyball, indoor track and field, and outdoor track and field. Conference USA members include: The University of Alabama at Birmingham, The University of Cincinnati, DePaul University, The University of Houston, The University of Louisville, Marquette University, The University of Memphis, Saint Louis University, The University of South Florida, The University of Southern Mississippi, Tulane University, and UNC Charlotte.

Black Student Union

The Black Student Union (BSU) is an organization designed to address issues facing the African-American student community. The activities it sponsors include the annual Halloween Carnival, the Fall and Spring Step Shows, the Housekeeper's Appreciation Day, and an annual Awards Banquet. This organization also produces a student-run publication "The Black Perspective" for the articulation of the voices of African-American students. BSU can be contacted at: the Multicultural Center, Cone University Center, (704) 547-2521

Honorary Organizations

There are a number of national/international honor societies which have chapters at UNC Charlotte. Further information on each organization is available from the department or college offering the discipline.

Intramurals and Recreational Services

There is a comprehensive program to provide enjoyable recreational opportunities for UNC Charlotte students. The program includes team, dual and individual intramural sports for men and women, and ample opportunities for unstructured "free play" activities. In addition, there are 16 active sports clubs and a diverse schedule of fitness classes available to the entire University community.

Non-traditional Student Organization

The Non-traditional Student Organization (NTSO) is a student government and OASES funded support group for adult students. For more information and membership forms, contact the Office of Adult Students and Evening Services (OASES) in 106 Barnard Building, (704) 547-2596. The NTSO phone number is (704) 547-2447, http://www.uncc.edu/ntso, (E-mail_ ntso@email.uncc.edu.

Outdoor Experiences

Venture offers experiential learning, non-credit courses and workshops in outdoor settings. Activities include weekend trips in a variety of outdoor sports from backpacking to kayaking, and programs at our on-campus team building course, high ropes challenge course, and indoor climbing wall. Venture programs are modeled on Outward Bound and are designed to facilitate individual growth through physical challenge, group interaction, and personal reflection. VOLTAGE (Venture Outdoor Leadership Training and Group Experience) trains student leaders to instruct Venture Programs. Venture houses a resource library to help individuals plan their own trips. Outdoor camping gear can be rented.

Student Activity Facilities

The James H. Barnhardt Student Activity Center is a multi-purpose facility designed to meet the diverse social, cultural, and recreational needs of students at UNC Charlotte. The 9o00 seat arena is a first-class setting for athletic events as well as conferences, lectures, and

entertainment activities. Recreational opportunities are available daily in the two weight rooms, aerobics studio, indoor track, four indoor basketball/volleyball courts, and the indoor climbing wall. In addition, the Center includes a spacious food court, 7000 square foot game room, and large hospitality and meeting areas.

Belk gymnasium features basketball, volleyball and badminton courts, a swimming pool, racquetball courts, swimming pool and lockers for students, faculty and staff. It also houses classrooms and an auditorium for audiovisual presentations.

Student Leadership Development Program

The leadership program provides individuals with opportunities to develop leadership skills and abilities and provides the University and student organizations with potentially more effective and efficient leaders. The goal is to provide a comprehensive and diverse program of leadership development activities for existing student leaders and potential leaders. The leadership program is in the process of developing additional leadership development offerings specifically for graduate students in addition to their current programs already available to all students.

The program consists of several components (of interest to graduate students and graduate student organizations) each designed for a target group of campus leaders, members of their organizations or potential leaders of campus organizations.

- Leadership Transition Retreat: For established leaders
- Leadership Resource Area: Information on a variety of leadership topics for individuals and organizations
- Leadership Theory and the Dynamics of Group Process: A 3-hour course in Communication Studies
- Individual and Group Consultation: Co-sponsorship of leadership conferences for Greeks, women, and African-American students.
- Peer Leadership Course: A 3-hour course in Communication Studies for students currently in leadership positions.
- PILOT: An individualized program students complete in order to receive Leadership Certification.

The Leadership program can be contacted at: the Office of Student Activities, Cone Center, lower level, (704) 547-2521.

Student Government Association

The Student Government Association (SGA) is operated by students for students. Campus-wide issues are debated in the Legislature on campus. These issues are then represented on the Board of Trustees by the Student Body President, and formulated into policy proposals. The executive power of SGA is vested in the Student Body President and Student Body Vice President, their staffs, the Student University Advocates, the Student Defense Chief the Elections and Publicity Chair and a number of committees to which the President appoints students each year.

The Student Legislature of SGA includes the Chair of Legislature, the Speaker Pro Tempore, the Treasurer and Committee Members who are among the 67 elected representatives. Campus-wide elections are held in September and March (fall and spring elections). This body has the responsibility of enacting law as necessary to promote the general welfare of the student body. The Legislature meets every Wednesday at 5:00 p.m. and meetings are open to the campus community. The legislature approves the chartering of all primary and secondary clubs and organizations (currently there are 128, from the Accounting Society to the Wrestling Club). The legislative body also allocates funds to the primary clubs and organizations.

The Student Judiciary of SGA is composed of 21 elected Hearing Panel Members, the University Advocate's Office, and the Student Defense Office and their assistants. They have jurisdiction over cases involving violations of the Code of Student Responsibility, the Student Body Constitution, and various student statutes. To participate in SGA, students can run for election or apply for appointment. SGA is in Cone University Center, 547-4606.

Student Media

The University Times. Serving the University community, *The Times* is distributed free to both on- and off-campus locations, bringing news, events, sports, and features of importance to UNC Charlotte and the surrounding community.

Media Marketing is the advertising branch of Student Media responsible for contracting and sales of advertising for all student publications, generating campus promotions, special inserts and sections of *The Times*, as well as soliciting contributions for Student Media fund-raising efforts, circulation, and subscriptions. There is no need to be a business or marketing major; a desire to make the program an exciting and successful one is all that is necessary. *For information: Phone* 547-2160.

Sanskrit **Literary Arts Publication**, UNC Charlotte's literary-arts magazine, publishes both student and non-student work in four categories: art, photography, short fiction, and poetry. *Sanskrit* is an excellent vehicle for exposure of student talent and creative efforts. Submissions are encouraged and are due in the fall. Guidelines for submitting material and deadline information are available through the Student Media Offices Student Media can be contacted at: Cone Center, lower level, (704) 547-2663.

Student Organizations

The University has many clubs and organizations which help meet the academic, social, political, and religious needs of UNC Charlotte students. Contact the Student Government Office, 547-4606, or the Dean of Students

Office, 547-2375, for a listing of the clubs and organizations chartered by the Student Government Association.

University Program Board

The University Program Board (UPB) is a student-operated organization that plans and promotes social, cultural, educational, and recreational programs for students and the University community. These programs include concerts, coffeehouse entertainment, homecoming, lectures, fine arts, films, Jazzing, minority programs, Friday night events, and other special activities.

CAMPUS SERVICES

Campus Bookstore

The Bookstore offers new and used textbooks, non-required special interest and gift books, school supplies, computers, software and related items, greeting cards, imprinted gifts and clothing items. Services include special ordering of books not carried in stock.

Campus Transportation

City Buses: The Charlotte Transit System city bus lines serve UNC Charlotte (#29 from South Park and #39 from Uptown). Service is provided on a regular schedule connecting with established routes throughout the city. During the week, the first bus arrives on campus at 6:40 or 6:55 p.m. and the last bus departs at 9:30 or 9:40 p.m. depending on the route. Brochures containing detailed information regarding routes, schedules and monthly TRAC passes may be obtained in the Parking Services Office, or by calling the Charlotte Transit Authority at (704) 336-3366. Fees are set by Charlotte Transit and are subject to change. The Parking Services Office can be located at: the Auxiliary Services Building, 547-4285.

Health Insurance

The University makes available to students an Injury and Sickness insurance plan. As part of this plan, students may also cover their dependents. Student contract directly with the insurance carrier, ABCO 100) and not through the University. Coverage is for basic medical expenses for injury and sickness with an optional major medical benefit available. Rates for 1999-2000 ranged from $483 for the student only, for one calendar year, to $2,713 for the student, spouse and child, for one calendar year. Several coverage periods are available. Information is available in the Meal Plans, 49er Card, and Insurance Office, 162, Auxiliary Services Building, (704) 547-2754.

There is also a health insurance plan for children (under the age of 18) of students in North Carolina. This plan, NC Health Choice, is a federal and state funded health insurance plan. The plan is available at no or little cost depending on the parent's income level. For more information, contact the NC Family Health Resource Line at 1-800-367-2229 or ask for more information through the your local County Social Services Office.

Parking

All vehicles on campus must display a current decal or park in a visitor's parking deck or in a metered parking space. To purchase a student parking decal students need to know the make, model and license plate number of their automobile. Special hours for purchasing parking decals in the Cone University Center are established at the beginning of the fall and spring semesters. After these special hours end, all purchases or automobile registration changes are done directly in the Parking Services Office. Specific parking regulations are also available from this office. Decals are required the first Monday after classes start in the fall and spring semesters and on the first day of classes during both summer sessions. The Parking Services Office can be located at: the Auxiliary Services Building, 547-4285, (Web) www.uncc.edu/parking.

Police and Public Safety

The UNC Charlotte Office of Police and Public safety is responsible for maintaining a safe and pleasant environment in which members of the University community can live and learn. The 37 sworn police officers of the department are charged with the responsibility for protecting life and property, preventing and detecting crime at the University, as well as providing other essential services to members of the University community.

UNC Charlotte police officers patrol the campus on foot, bicycles, and in marked and unmarked police cars to help ensure your safety and the safety of the entire campus community. In addition to these patrol activities, the department maintains an investigative division that is responsible for conducting criminal investigations.
If a classroom, laboratory, or other life-threatening emergency were to occur, you should call 911 immediately. The communications division of the campus police department will receive and dispatch your emergency call. This particular division also monitors alarms around campus and handles calls from all of the 150+ campus emergency phones.
Police officers in the department give crime prevention and awareness workshops on a routine basis, and they encourage requests from you for these presentations. As an alternative to a presentation, copies of crime prevention and awareness material can be obtained from the Police and Public Safety department. Please utilize this department's resources; our campus police are here to help you in any way they can.

Recycling

Recycling is available to all who attend classes or work on the campus. Aluminum cans and plastic and glass bottles can be recycled in yellow and red containers placed both inside and outside classroom and office buildings.

Cardboard, office blend (white, color & fax paper, multi-part [carbonless] forms, file folders and computer paper) and news blend (newspapers, magazines, slick brochures, catalogs, phone books, soft back books, copier paper wrappers, and chipboard [i.e. envelope boxes]) papers can be recycled in all departments on campus. Batteries, videotapes and transparencies can be recycled at Media Services. Other materials such as steel and tin cans, spiral paper containers, newspapers, and paper bags can be recycled at the residence halls. Dining Services offers a discount for using reusable mugs at all campus dining locations. As a state agency, UNC Charlotte is striving to meet the North Carolina goal of 40% waste reduction by the year 2001. In the fiscal year 1998-1999, the University recycled 31% of the waste generated on campus.

Safety Services and Accident Prevention

The Environmental/Occupational Safety and Health Office is responsible for a university-wide program to establish and maintain a safe and healthy working, living, and learning environment for employees, students and visitors. Duties include accident prevention, safety inspections, safety training, fire prevention, life safety, occupational health, laboratory safety, radiation safety, biological safety, and hazardous waste management.

Personnel are available to work with members of the University community to reduce the risk of student or staff injury and may be consulted with on special questions and issues. The Environmental/Occupational Safety and Health Office can be located at: 119 Garinger Building, 547-4291.

Student I.D.'s

Student 49er I.D. cards are required of each UNC Charlotte student to be able to utilize many of the campus services and programs. I.D. cards are valid throughout a student's college career during semesters in which he or she is enrolled. Initial I.D. costs are paid for by student fees. Replacement cards are available for a minimal fee. The 49er Card I.D. Office is co-located with the Food Service Office adjacent to the Main Street Market Cafeteria in Cone University Center. 547-2216

UNC Charlotte Uptown

The University offers selected upper division undergraduate and graduate courses and a variety of continuing personal and professional development programs at its UNC Charlotte Uptown center. Classes are scheduled for the convenience of persons employed in or living near the central business core of the city. UNC Charlotte Uptown is located at 220 North Tryon Street, on the third floor of the new Mint Museum of Craft + Design. When traveling I-77, either north or south, exit onto Fifth Street. Stay on east Fifth Street until you reach Tryon Street.

THE UNIVERSITY and THE COMMUNITY

The University recognizes that its mission reaches beyond the borders of the campus to the surrounding region and the state. The University touches many facets of community life and serves as a catalyst for development of a regional approach to solving problems in education, economic development, transportation, the environment, cultural amenities, and the quality of life. Faculty, staff and students have made significant impact on the region through research, historic preservation, planning, the arts and literature, and the delivery of government and social services.

Alumni Affairs

The Office of Alumni Affairs is located in the Alumni House on Highway 49, serves as the liaison between the University and all graduates. The Director of Alumni Affairs is the chief administrative officer, coordinating activities of the office of Alumni Affairs and carrying out the objectives, goals and policies of the Alumni Association.

The Alumni Association's primary purpose is to involve alumni in the promotion, advancement, and support of the mission of UNC Charlotte and to develop and stimulate a continuing interest in our *Alma Mater* by providing opportunities for service, fellowship, and loyalty. A 32-member Board of Governors, elected by the active membership, establishes policy of the Alumni Association and assists in the planning and implementation of projects, events, and programs. Active members of the association are those alumni who contribute to the University or the UNC Charlotte Foundation.

Programs of the Alumni Association include the Alumni Awards Banquet, regional and collegiate chapters, homecoming activities, networking socials, public affairs events, reunions, merchandising opportunities, group travel, athletic support, recognition of outstanding seniors, and sponsorship of the Student Alumni Ambassadors. Alumni have the opportunity to support academic excellence through the Chancellor's Club, which annually provides Alumni Scholarships for Merit to four students at the University.

The Alumni Association offers several services and products to alumni through the alumni services program. These include internet access service, temporary health insurance, home and auto insurance, rental car discounts, career services, credit card, graduate school test preparation, and several products unique to UNC Charlotte alumni such as watches, rings, diploma display, and various items of apparel. All of these services and products are available through the Alumni Affairs Office or on-line through the Alumni Association web site.

The Alumni Office seeks to maintain lifelong contact with all graduates. Graduates are encouraged to become active in the Alumni Association and to notify the Alumni Affairs Office of address changes, employment information and other significant events, such as marriages, births and honors. In this way, adequate records can be maintained, and the Alumni Affairs Office can publish news about graduates in the *UNC Charlotte Magazine*. The Alumni Affairs Office can be contacted at: The Alumni House, UNC Charlotte, 9201University City Blvd, Charlotte, NC 28223, (704) 547-2273 or, for those outside Mecklenburg County, 1-800-PIK-UNCC; (Fax) (704) 547-3962, (Web)www.uncc49er.net., (E-mail) alumni@email.uncc.edu.

Ben Craig Center

The Center located in the University Research Park, is a non-profit corporation established by UNC Charlotte in conjunction with some of the major private/sector interests in the community. The mission of the Center is to support the growth and development of entrepreneurial companies. It accomplishes this through its business incubator and international programs.

Continuing Education, Distance Education/Extension, and Summer Programs

Recognizing that learning must be a lifelong activity, the University provides opportunities for adults to pursue their continuing education through degree-related studies and special non-credit programs.

Continuing Education

Non-credit courses, seminars, workshops and conferences designed to keep adults current and productive in their professions are offered through Continuing Education. Specific programs are provided each year for the continuing professional education of accountants, architects, managers in the public and private sectors, engineers, nurses, psychotherapists and counselors, teachers and other school personnel, information specialists, and elected public officials. Special lectures and forums also are offered in the arts, sciences, humanities, and public policy for the personal enrichment of all interested citizens.

Distance Education/Extension

Through Distance Education/Extension, UNC Charlotte provides off-campus students with the opportunity to participate in selected undergraduate and graduate degree programs, graduate certificate programs, and courses required to obtain teacher licensure. Options for delivery include sending a UNC Charlotte faculty member to a remote location to teach a course in person, using one of two state-wide interactive video networks to link a UNC Charlotte faculty member on the campus in Charlotte with students attending class at remote locations throughout the state, and transmitting instruction via the Internet. The two video networks currently utilized by UNC Charlotte are the North Carolina Information Highway (NCIH) and the microwave network maintained by the Microelectronics Center of North Carolina (MCNC). In addition, the university has the ability to deliver educational programming over Cable Channel 22, which is the channel reserved for the university by the local cable service.

During the summer, the office schedules a variety of credit and non-credit programs on the campus and at approved off-campus sites. The Office of Continuing Education, Extension, and Summer Programs can be contacted at 547-2424 for specific information about its programs.

Mathematics and Science Education Center

The Center works closely with southwest regional teachers and school administrators to provide professional development activities for K-12 science and mathematics teachers in the form of cognate area and methodology updating and enhancement. The Center offers academic year and summer programs of varied topics and duration, and professional contacts through science and mathematics organizations. In addition, the Center operates both a Pre-College Program, to enhance the mathematics and science academic background of underrepresented, minority and female, middle through high school students; and a Summer Ventures Program for academically talented high school students. Contact the Mathematics and Science Education Center at (704) 547-4838.

Professional and Applied Ethics

The Center for Professional and Applied Ethics assists professionals and other clients locally, regionally and nationally in identifying, analyzing, and resolving ethical dilemmas. As a public service center, its focus is the practical and applied--not the theoretical and abstract. Its services include ethics audits, seminars, in-service education, ethics literature, and individual or institutional consultation.

Public Relations

Public Relations is located in the Reese Building, is the official communications channel through which the University disseminates information to its various publics. The Office has three major functions: (1) external media relations; (2) internal communications; and (3) official University publications that are distributed to off-campus audiences. The Office distributes news and feature stories about University programs and its people as well as hometown releases about achievements of students. A weekly newsletter, *Campus News*, informs faculty and staff about campus activities. The Office maintains the University's Home Page on the World Wide Web and provides assistance in printing official publications for University departments. The Office also publishes the University Magazine and operates the campus switchboard.

University Development

Known traditionally as a "state-supported institution," UNC Charlotte is more accurately a "state-*assisted* institution," as the University depends on non-state resources for more than half of its operating needs. For this reason, philanthropy is critically important. Indeed, it provides the critical margin of excellence so that the University can fulfill its threefold mission of education, research and public service.

The Office of University Development plays a vital role by securing philanthropic support for the University, particularly through the establishment and enhancement of relationships with the University's alumni, parents and friends, including corporations, foundations and organizations. The support can take many forms, such as gifts of cash, appreciated securities, real estate, equipment and works of art.

Philanthropy provides the resources for UNC Charlotte to recruit and retain outstanding faculty, to educate the leaders of tomorrow and to properly serve the Charlotte region. Also, it is quite possible to support UNC Charlotte and enjoy significant tax benefits at the same time. For more information, please call the Office of Development at (704) 547-2271.

Urban Institute

The UNC Charlotte Urban Institute develops and supports programs that give impetus to the University's urban mission. The Institute is a catalyst for projects designed to meet the applied research needs of urban and developing areas of the Charlotte Metropolitan region. It also provides administrative and technical support to organizations involved with issues of an urbanizing society. Projects are initiated by members of the faculty, community clients or the Institute staff and focus on a broad spectrum of urban topics, e.g., local government, the environment, land use, business assistance and economic development. Students may become involved in Institute projects as part-time research assistants or interviewers, or they may become involved with the Institute in conjunction with course work or degree requirements by writing term papers, graduate theses, or completing internships. The Institute's program areas are:

Carolinas Land Conservation Network is a membership organization open to agencies and individuals who have an interest in the conservation of land in the central piedmont region of the Carolinas. The program maintains an information base of conservation initiatives in the region and implements research and educational activities relating to broadening the community's understanding of the importance of conservation efforts.

Community Research and Service conducts needs assessments and public opinion surveys of both target and general populations focusing on issues of concern to local, regional and national clients. The program also provides support to government and community agencies in the planning and implementation of special projects and strategic planning activities.

Economic Development and Planning engages in research and planning for community, industrial and commercial development. Types of projects include land use plans, data collection and analysis for economic development, population estimates and projections, analysis of growth patterns, industrial targeting studies, housing research and the publication of regional business and political directories.

Evaluation Research provides research and evaluation services focusing on human service programs. Impartial, third-party program evaluation is provided to decision-makers in government and private organizations for use in responsible financial management and long-term decision making regarding program policy and funding issues.

Southeast Waste Exchange promotes safe and cost-effective waste management and environmental protection. The program publishes a bi-monthly catalog containing listings for industrial by-products and surplus materials and conducts workshops on the topics of recycling and the safe management of hazardous waste materials.

Technical Services specializes in the application of microcomputer technology for public sector clients. A major, on-going project involves providing software support and training for a statewide computerized school bus routing project. Other services include database design and desktop mapping projects for research and outreach projects.

OTHER UNIVERSITY SERVICES

Chimney Rock Park Field Station

The Station is located in the Blue Ridge Mountains, 30 miles southeast of Asheville. The University has an agreement with Chimney Rock Park to investigate the biological, geological and cultural features of the 800-acre park. Area available for study extends from the Broad River at the bottom of Hickory Nut Gorge to the top, a vertical climb of over 1,500 feet.

UNC Charlotte Experimental Ecological Reserve

The Reserve is a 100-acre tract of land set aside on campus by the UNC Charlotte Board of Trustees as a permanent ecological reserve for use as an outdoor classroom and laboratory. The reserve includes an eight-acre old field, pine stands, mixed pine-hardwood forest, and a relatively undisturbed 10-acre watershed of oak-hickory forest.

UNC Charlotte Rocky River Wildlife Refuge

The Refuge is a 46-acre natural area located east of Charlotte in Stanly County. Its purpose is to preserve the natural features of the area and allow research and field trips to study the plants and animals within the North Carolina slate belt formation.

UNC Charlotte Botanical Gardens

The Gardens, located on campus, consist of the McMillan Academic Greenhouse, the Van Landingham Rhododendron Glen, and the Susie Harwood Ornamentals Garden. Begun in 1966, these gardens combine indoor and outdoor facilities for teaching, research and public display of a wide variety of native and exotic plants.

UNIVERSITY REGULATION of STUDENT CONDUCT

As students willingly accept the benefits of membership in the UNC Charlotte academic community, they acquire obligations to observe and uphold the principles and standards that define the terms of the UNC Charlotte community.

The University of North Carolina at Charlotte has enacted two codes governing student conduct. The University has also enacted a program for the prevention of the use of illegal drugs and alcohol abuse. All UNC Charlotte students are obligated to be familiar with these codes and to conduct themselves in accordance with the standards set forth.

UNC CHARLOTTE CODE of STUDENT ACADEMIC INTEGRITY

The *Code Of Student Academic Integrity* governs the responsibility of students to maintain integrity in academic work, defines violations of the standards, describes procedures for handling alleged violations of the standards, and lists applicable penalties. The following conduct is prohibited in that *Code* as violating those standards:

A. Cheating. Intentionally using or attempting to use unauthorized materials, information, notes, study aids or other devices in any academic exercise. This definition includes unauthorized communication of information during an academic exercise.
B. Fabrication and Falsification. Intentional and unauthorized alteration or invention of any information or citation in an academic exercise. Falsification is a matter of altering information, while fabrication is a matter of inventing or counterfeiting information for use in any academic exercise.
C. Multiple Submission. The submission of substantial portions of the same academic work (including oral reports) for credit more than once without authorization.
D. Plagiarism. Intentionally or knowingly presenting the work of another as one's own (i.e., without proper acknowledgment of the source). The sole exception to the requirement of acknowledging sources is when the ideas, information, etc. are common knowledge.
E. Abuse of Academic Materials. Intentionally or knowingly destroying, stealing or making inaccessible library or other academic resource material.
F. Complicity in Academic Dishonesty. Intentionally or knowingly helping or attempting to help another to commit an act of academic dishonesty.

A full explanation of these definitions, and a description of procedures used in cases where student violations are alleged, is found in the complete text of The UNC Charlotte Code of Student Academic Integrity. The chair of the Academic Integrity Board is available to consult with teaching assistants, their supervisors, and department chairs about academic integrity issues. If it is determined that an academic integrity case should be brought before the Academic Integrity Board, a panel from the Board hears the case to determine if it violates the Code. A copy of the Code may be obtained at the Office of the Dean of Students or accessed online at www.uncc.edu/policystate/ps-105.html. This Code may be modified from time to time. Users are advised to contact the Office of the Dean of Students to assure the most recent edition is being used. Student inquiries should be directed initially to the Dean of Students Office, 217 King Building, 547-2376.

CODE of STUDENT RESPONSIBILITY

The *UNC Charlotte Code of Student Responsibility* sets forth standards relating to student conduct other than academic conduct, describes the procedures for handling cases, and sets forth applicable sanctions. The following conduct or attempt to engage in the following conduct is prohibited and subjects a student to disciplinary action:*[Note: Letters j and p have been intentionally omitted for continuity in record keeping.]*

A. Causing physical harm to any person, or causing reasonable apprehension of such harm, or subjecting another person to a substantial risk of physical injury or emotional harm. Verbal or physical abuse, intimidating conduct, or other conduct which violates University policy on sexual harassment or "fighting words" harassment as set forth in Policy Statements #61 and #95, constitute a violation of this disciplinary standard. The full text of both policies is available in the Office of the Dean of Students.
B. Using, possessing or storing any weapon, dangerous chemical, or explosive without authorization.
C. Initiating or causing to be initiated any false report, warning or threat of fire, explosion, or other emergency.
D. Interfering with normal University activities, including, but not limited to, studying, teaching, research, the

expression of ideas, University administration, speeches and other public or private events, and fire, police or other emergency services. Acts prohibited in University Policy Statement #58, "interference with University Operations," which prohibits student action taken "with intent to obstruct or disrupt any normal operation or function of the University," and Policy Statement #96, "Policy on Conduct at Speech Events," which prohibits certain disruptive activities at speech events on campus. Full texts of both policies are available in the Office of the Dean of Students.

E. Knowingly violating the terms of any disciplinary sanction imposed in accordance with this Code.

F. Possessing any controlled substance, or manufacturing, selling or delivering any controlled substance or possessing with intent to manufacture, sell or deliver, any controlled substance. Minimum penalties and certain other requirements apply where controlled substance offenses are at issue, pursuant to University Policy Statement #87, "Program to Prevent Use of Illegal Drugs and Alcohol Abuse." That policy is available in the Office of the Dean of Students.

G. Misusing or damaging fire safety equipment or elevators.

H. Furnishing false information to the University; misrepresenting or concealing one's organizational affiliation(s) or sponsorship(s) for the purpose of enticing another person into joining or participating in a group or organization.

I. Forgery, unauthorized alteration, or unauthorized use or misuse of any document or instrument of identification.

K. Theft or attempted theft of property or services, possessing stolen property; or possessing property that is not your own without owner authorization.

L. Destroying or damaging the property of others or University property.

M. Failing to comply with the reasonable directions of University officials, including but not limited to campus police officers, or Residence Life Staff, acting in performance of their duties.

N. Violating published University regulations or policies, as approved by the Vice Chancellor for Student Affairs. Such regulations or policies include but are not limited to the residence hall contract, as well as regulations relating to entry and use of University facilities, use of vehicles and amplifying equipment, campus demonstrations, and misuse of identification cards.

O. Possessing, consuming, or distributing alcoholic beverages without University authorization including but not limited to possessing or consuming of alcoholic beverages by students below the legal minimum age; displaying or consumption of alcoholic beverages in campus residences by students less than twenty-one years of age; furnishing, or selling any alcoholic beverages to any person not of sufficient legal age to possess or consume such alcoholic beverage; failing to abide by the provisions of an alcoholic beverage approval form; or making any sale of any alcoholic beverage on the University campus. (The full text of University Policy Statement #57, "Use and Consumption of Alcoholic Beverages," is available for inspection in the Office of the Dean of Students.)

Q. Being present in or using University premises, facilities, or property without University authorization.

R. Using or possessing fireworks on University premises or at University activities without University authorization.

S. Engaging in disorderly conduct such as fighting, threatening behavior, public disturbance, or drunk and disorderly conduct.

T. Causing or permitting a person, in relation to membership in a society, club or similar organized group (whether or not recognized by the University), to participate in any activity that subjects that person or others to unnecessary risks of physical injury or extreme mental distress, whether or not such person has consented to participation in the activity. The full text of University Statement #83, "Hazing Policy," is available in the Office of the Dean of Students.

The *Code of Student Responsibility* is administered by the Dean of Students Office. A copy of the Code may be obtained at the Office of the Dean of Students or accessed online at www.uncc.edu/policystate/ps-104.html. This Code may be modified from time to time. Users are advised to contact the Office of the Dean of Students to assure the most recent edition is being used. Student inquiries should be directed initially to the Dean of Students Office, 217 King Building, 547-2376.

Illegal Use of Drugs or Alcohol Abuse

In keeping with efforts to maintain an environment that supports and encourages the pursuit and dissemination of knowledge, it is the policy of the University to consider the use of illegal drugs or alcohol abuse by students, faculty and staff or by others on premises under University control to be unacceptable conduct that adversely affects the educational environment. The full texts of these policies (#57 and #87) are available in the Dean of Students Office and the Graduate School and online at http://www.uncc.edu/policystate/ps-57.html and http://www.uncc.edu/policystate/ps-87.html

Sexual Harassment Prevention

Below is an excerpt from the University "Sexual Harassment Prevention" Policy Statement #61. The full text of the Policy Statement is available in the Dean of Students Office, the Human Resources Office and the Graduate School and is available online at http://www.uncc.edu/policystate/ps-61.html

I. Statement of Policy:

The University of North Carolina at Charlotte affirms its commitment to ensuring an environment for all employees and students which is fair, humane and respectful - an environment which supports and rewards employee and student performance on the basis of relevant considerations such as ability and effort. Behaviors, which inappropriately assert sexuality as

relevant to employee or student performance, are damaging to this environment. Sexual harassment is a violation of both law and University policy and will not be tolerated in the University community. Sexual harassment is a particularly sensitive issue which may affect any member of the University community and as such will be dealt with promptly and confidentially by the University administration.

II. Definitions of Sexual Harassment:
...B. Students: Sexual harassment of students is a form of prohibited sex discrimination. Unwelcome sexual advances, requests for sexual favors, or other verbal, nonverbal, or physical conduct of a sexual nature by a University employee, by another student, or by a third party, constitutes sexual harassment if such conduct is sufficiently severe, persistent, or pervasive to limit the student's ability to participate in or benefit from an education program or activity, or create a hostile or abusive educational environment.

"Quid pro quo" sexual harassment is equally unlawful. It occurs when a University employee explicitly or implicitly conditions a student's participation in an education program or activity, or bases an educational decision, on the student's submission to unwelcome sexual advances, requests for sexual favors, or other verbal, nonverbal, or physical conduct of a sexual nature. "Quid pro quo" harassment occurs whether the student resists and suffers the threatened harm or submits and thus avoids the threatened harm...."

A student who believes that he or she has been the victim of sexual harassment by any faculty member, staff member, or student, should discuss the matter promptly with the Dean of Students or the University Affirmative Action Officer. Either of these officers will advise the student, in confidence, of the options available for formal and informal response to the student's concern. The officer also maintains information on resources available to provide the student with emotional support and formal and informal counseling.

Where sexual harassment has occurred, the University will assist the student in obtaining relief from the harassment. In appropriate cases, the University will institute disciplinary proceedings against the accused.

Sexual Orientation

The University believes that educational and employment decisions should be based on the abilities and qualifications of individuals and should not be based on irrelevant factors, including personal characteristics that have no connection with academic abilities or job performance. The sexual orientation of an individual is not a relevant factor upon which educational and employment decisions are to be based. A student having a complaint of discrimination because of sexual orientation should notify the Dean of Students Office. The full text of this policy (#98) is available in the Dean of Students Office, the Human Resources Office andthe Graduate School and online at http://www.uncc.edu/policystate/ps-98.html

"Fighting Words" Harassment

The University seeks to provide an environment for students, faculty, and staff which is fair, humane, and respectful, and from which violence or the threat of violence is eliminated. The University reserves the right to intervene when "fighting words" (personally abusive epithets) which, when directly addressed to any ordinary person are, in the context used and as a matter of common knowledge, inherently likely to provide an immediate and violent reaction. Expressions include such terms or gestures widely recognized to be derogatory references to race, ethnicity, religion, gender, sexual orientation, disability and other personal characteristics. The full text of this policy (#95) is available in theDean of Students Office and the Graduate School and online at http://www.uncc.edu/policystate/ps-95.html

Immunization Requirements

North Carolina State law requires that all UNC Charlotte students provide documentation certifying that they have met certain immunization requirements. To comply with the law, all new and readmitted students in any category must submit a completed medical history form to the Brocker Health Center.

Exemptions

1) Students taking all classes after 3:00 p.m.
2) Students taking classes which only meet off-campus.
3) Students residing off campus and taking four credits or less.
4) Students taking weekend classes only.

Penalty for Non-compliance

The Registrar's Office is required by law to cancel the registration of any student who has not provided the appropriate immunization records. Students whose registration is cancelled will not receive credit for courses whether or not they complete course requirements. **There is no refund of tuition or fees for Immunization Cancellations.**

Required Immunizations

http://www.uncc.edu/health_svcs/immunization.htm

Tuberculin Skin Test (PPD) is required for all International Students. (A chest x-ray is required if there is a history of a positive skin test.)

Students 17 years of age or younger

3 Diphtheria, Tetanus, Pertussis or Td
1 Tetanus, Diphtheria in last 10 years
3 Oral Polio Virus
2 Measles (rubeola), 1 Mumps, 1 Rubella (2 MMR doses meet this requirement)

Students born in 1957 or later and 18 years or older

3 Diphtheria, Tetanus, Pertussis or Td
1 Tetanus, Diphtheria in last 10 years
2 Measles (rubeola), 1 Mumps, 1 Rubella (2 MMR doses meet this requirement)

Students born before 1957

3 Diphtheria, Tetanus, Pertussis or Td
1 Tetanus, Diphtheria in last 10 years
1 Rubella (MMR meets this requirement) A rubella injection is not required for students over the age of 50.

All Students

1) Tuberculin Skin Test (PPD) is required only for international students.
2) History of measles is acceptable if physician verified student contracted the disease prior to January 1, 1994.
3) Blood Titer test is accepted for Rubeola, Mumps, Rubella and Hepatitis B (lab tests must be attached).
4) Only one (MMR) Measles, Mumps, Rubella dose (on or after first birthday) is required for students who entered the University of North Carolina (UNC) system before January 1, 1994.
5) Students that entered the UNC system after July 1, 1994 must have two doses of measles (rubeola) vaccine on or after the first birthday; 2 MMR doses meet this requirement.

Contact the Brocker Health Center, (704) 547-4617 for further information.

DIRECTORY

The University of North Carolina Sixteen Constituent Institutions

THE OFFICERS OF THE UNIVERSITY OF NORTH CAROLINA

Molly Corbett Broad, B.A., M.A.
President

Gretchen M. Bataille, B.A., M.A., D.A.
Senior Vice President-Academic Affairs

Gary Barnes, B.A., M.S., Ph.D.
Vice President-Program Assessment and Public Service

Charles R. Coble, A.A., A.B., M.A.T., Ed.D.
Vice President-University School Programs

Rosalind R. Fuse-Hall, B.S., J.D.
Secretary of the University

J. B. Milliken, B.A., J.D.
Vice President-Public Affairs and University Advancement

Diana Oblinger, B.S., M.S., Ph.D.
Vice President-Information Resources and Chief Information Officer

Judith Pulley, B.A., M.A., Ph.D.
Vice President-Planning

Richard H. Robinson, Jr., A.B., LL.B
Vice President and General Counsel

George A. Antonelli, B.A., M.A., Ph.D.
University Catalog Officer

THE MEMBERS OF THE BOARD OF GOVERNORS

Benfamin S. Ruffin, Winston-Salem, *Chairman*
John F.A.V. Cecil, Asheville, *Vice Chairman*
Lois G. Britt, Rose Hill, *Secretary*
Bradley T. Adcock, Durham
G. Irvin Aldridge, Manteo
J. Addison Bell, Matthews
F. Edward Broadwell, Jr., Asheville
Robert J. Brown, High Point
William T. Brown, Fayetteville
Angela R. Bryant, Rocky Mount
William L. Burns, Jr., Durham
C. Clifford Cameron, Charlotte
Bert Collins, Durham
Chancy R. Edwards, Knightdale
Ray S. Farris, Charlotte
H. Frank Grainger, Cary
James E. Holshouser, Southern Pines
Peter Keber, Charlotte
Teena S. Little, Southern Pines
Helen Rhyne Marvin, Gastonia
Timothy Keith Moore, Shelby
Jeffrey L. Nieman, Jr., *(Ex officio)* Chapel Hill
Maxine H. O'Kelley, Burlington
R. V. Owens III, Nags Head
Barbara S. Perry, Kinston
Patsy B. Perry, Durham
D. Wayne Peterson, Pinehurst
Jim W. Phillips, Jr., Greensboro
H. D. Reaves, Jr., Fayetteville
John L. Sanders, Chapel Hill
J. Craig Souza, Raleigh
Priscilla P. Taylor, Chapel Hill
Robert F. Warwick, Wilmington
J. Bradley Wilson, Durham
Ruth Dial Woods, Pembroke

THE BOARD OF TRUSTEES FOR UNC CHARLOTTE

Chairman
Howard C. Bissell, Charlotte
Vice Chairman
Ruth G. Shaw, Charlotte
Secretary
James B. Garland, Gastonia
Ex Officio Member
Mark Lombardi, Student Body President, Charlotte
Assistant Secretary
James E. Dixon III, Charlotte

Term Expires June 30, 2001
Howard C. Bissell, Charlotte
The Honorable James B. Garland, Gastonia
Howard H. Haworth, Charlotte
Frederick J. Figge II, Charlotte
Edward J. Snyder, Jr. Albemarle
Charles E. Zeigler, Jr., Gastonia

Term Expires June 30, 2003
Stephanie R. Counts, Charlotte
Dorothy W. Harris, Charlotte
The Honorable Irwin Belk, Charlotte
Robert B. Jordan III, Mt. Gilead
R. William McCanless, Salisbury
Ruth G. Shaw, Charlotte

Honorary Trustees

F. Douglas Biddy, Durham
Sara H. Bissell, Charlotte
The Honorable Douglas W. Booth, Charlotte
C .C. Cameron, Charlotte
Kathleen R. Crosby, Charlotte
R. Stuart Dickson, Charlotte
John L. Fraley, Sr., Cherryville
John L. Fraley, Jr, Cherryville
Elisabeth G. Hair, Charlotte
James A. Hardison, Jr, Wadesboro
The Honorable Robert B. Jordan, III, Mt. Gilead
Graeme M. Keith, Charlotte
W. Duke Kimbrell, Gastonia
Margaret R. King, Charlotte
John D. Lewis, Charlotte
Bobby G. Lowery, Charlotte
Hugh L. McColl, Jr., Charlotte
Martha M. Melvin, Harrisburg
Russell M. Robinson II, Charlotte
Meredith R. Spangler, Chapel Hill
Thomas I. Storrs, Charlotte
Eulada P. Watt, Charlotte

THE ADMINISTRATIVE OFFICERS AND STAFF

CHANCELLOR'S OFFICE

James H. Woodward, B.S.A.E., M.S.A.E., Ph.D., M.B.A.
Chancellor

James E. Dixon, III, A.B., M.A., J.D.
Executive Assistant to the Chancellor and Assistant Secretary of the Board of Trustees

William M. Steimer, B.A., J.D.
University Attorney

R. Edward Kiser, Jr., A.B.
Executive Assistant to the Chancellor for Constituent Relations

ACADEMIC AFFAIRS

Denise M. Trauth, B.A., M.A., Ph.D.
Provost and Vice Chancellor

Wayne A. Walcott, B.A., M.A., Ph.D.
Associate Provost

Raymond A. Frankle, A.A., B.A., M.L.S.
Special Assistant to the Provost

Robert J. Mundt, A.B., M.A., Ph.D.
Associate Vice Chancellor for Graduate Programs and Dean of the Graduate School

Thomas Reynolds, B.A., M.A., Ph.D.
Associate Dean of the Graduate School

Gary M. Morgan, B.S., M.A.
Assistant Dean for Graduate Student Affairs

Johnna Watson, A.A., B.A., M.A.
Assistant Dean of the Graduate School for Enrollment Services and Information Systems

Wanda B. Fisher, B.S.
Director, Institutional Research

Stephen R. Mosier, B.S., M.S., Ph.D.
Associate Vice Chancellor, Research

Kathi M. Baucom, B.A., M.Ed.
Assistant Vice Chancellor for Enrollment Management

Janet Filer, B.A., M.S., Ed.D.
Director, Office of Disability Services

Charlynn E. Ross, B.S., M.A.
Director, University Learning Center

Gregory Davis, B.A., M.Div., Ph.D.
Director, Minority Academic Services

Denise Dwight Smith, B.S., M.S.
Director, University Career Center

Deborah S. Bosley, B.A., M.A. Ph.D.
Director, University Writing Programs

LTC Gary M. Ardo, B.S., M.B.A.
Chair, Department of Aerospace Studies

LTC Michael W. Alexander, B.S., M.M.S.
Chair, Army ROTC

Richard Yount, B.A., M.Ed.
University Registrar

Bonnie Rugar, B.A., M.A.
Associate Registrar

Janet D. Daniel, B.S., M.Ed., Ed.S.
Director, Office of Adult Students and Evening Services

Craig C. Fulton, B.A.
Director, Undergraduate Admissions

William J. McCoy, A.B., M.A., Ph.D.
Associate Vice Chancellor, Extended Academic Programs

Constance L. Martin, B.A., M.L.S., Ed.D.
Director, Continuing Education, Extension, and Summer Programs

Edward Brynn, B.S.F.S., M.A., Ph.D., M.Litt, Ph.D.
Associate Vice Chancellor, International Programs

Jeffrey Adams-Davis, B.A., M.A.
Director, English Language Training Institute

Marian Beane, B.A., M.A,
Director, International Students and Scholars Services

Patrick J. O'Neill, B.A., M.P.A.
Director, International Admissions

Charles Clinton Hight, B.Arch.
Dean, College of Architecture

Kenneth Lambla, B.E.D., M.Arch.
Chair for Instruction

Schley R. Lyons, B.S.B.A., M.A., Ph.D.
Dean, College of Arts and Sciences

Edward S. Perzel, B.A., M.A., Ph.D.
Associate Dean, College of Arts and Sciences

Lesley A. Brown, B.S.E., M.A.
Director of Sponsored Research

Mario J. Azevedo, B.A., M.A., Ph.D.
Chair, Department of African-American and African Studies

Jay Jacoby, B.A., M.A., Ph.D
Interim Chair, Department of Art

Mark G. Clemens, B.S., Ph.D.
Chair, Department of Biology

Arthur Greenberg, B.A., M.S., Ph.D.
Chair, Department of Chemistry

Bill J. Hill, Jr., B.S., M.A., Ph.D.
Chair, Communication Studies

M. Dwayne Smith, B.S , M.A., Ph.D.
Interim Chair, Department of Criminal Justice

Sybil D. Huskey, B.F.A., M.F.A.
Chair, Department of Dance and Theatre

Cyril H. Knoblauch, B.A., M.A., Ph.D.
Chair, Department of English

Martha Miller, B.A., M.A., Ph.D.
Interim Chair, Department of Foreign Languages

Owen Furuseth, B.S., M.A., Ph.D.
Chair, Department of Geography and Earth Sciences

John Smail, B.A., M.A., Ph.D.
Chair, Department of History

Ram C. Tiwari, B.S., M.S., Ph.D.
Chair, Department of Mathematics

Royce Lumpkin, B.M.Ed, M.M.Ed., Ph.D.
Chair, Department of Music

William C. Gay, B.A., Ph.D.
Chair, Department of Philosophy

Larry Leamy, B.S., M.S., Ph.D.
Interim Chair, Department of Physics

Theodore S. Arrington, B.A., M.A., Ph.D.
Chair, Department of Political Science

Margaret Stanley-Hagan, B.A., M.A., Ph.D.
Chair, Department of Psychology

Edward St. Clair, B.A., B.D., Ph.D.
Chair, Department of Religious Studies

M. Dwayne Smith, B.S., M.A., Ph.D.
Chair, Department of Sociology and Anthropology,

Philip Popple, B.S., M.S.W., Ph.D.
Chair, Department of Social Work

Claude C. Lilly III, B.A., M.A., Ph.D., CPCU, CLU
Dean, Belk College of Business Administration

Richard M. Conboy, B.S.B.A., M.B.A., Ph.D.
Associate Dean, Belk College of Business Administration

Virginia Geurin, B.S., B.A., M.B.A., Ph.D.
Associate Dean for Graduate Studies and Research, Belk College of Business Administration

Jack T. Hogue, B.B.A., M.B.A.,Ph.D.
Director, Student Affairs, Belk College of Business Administration

A. Beth Totaro, B.A., M.P.A.
Director, Special Projects, Belk College of Business Administration

Calvin W. Sealey, Jr., B.A., M.A., Ph.D.
Director, Center for Financial Services

L. Howard Godfrey, B.S., M.A., Ph.D.
Chair, Department of Accounting

Peter M. Schwarz, B.S., M.A., Ph.D.
Chair, Department of Economics
Calvin W. Sealey, Jr., B.A., M.A., Ph.D.
Chair, Department of Finance and Business Law

Virginia Geurin, B.S., B.A., M.B.A., Ph.D.
Interim Chair, Department of Management

A. Cem Saydam, B.S., Ph.D.
Chair, Department of Information& Operations Management

Linda E. Swayne, B.B.A., M.B.A., Ph.D
Chair, Department of Marketing

Mary Lynne Calhoun, A.B., M.Ed., Ph.D.
Interim Dean, College of Education
John Tutterow
Director, Office of Student Academic Services

David Test, B.A., M.A., Ph.D.
Interim Chair, Department of Counseling, Special Education, and Child Development

J. Allen Queen, B.S.Ed., M.A.Ed., Ed.D.
Chair, Department of Educational Administration, Research, and Technology

Eugene Schaffer, B.A., M.Ed., Ed.D.
Chair, Department of Middle, Secondary, and K-12 Education

Robert Audette, B.A., M.A., Ph.D.
Interim Chair, Department of Reading and Elementary Education

Victoria Page Jaus, B.A., M.S., Ed.S.
Director, Office of Field Experiences

Misty Hathcock, B.A., M.A., C.A.S.
Director, Teaching Fellows Program

Robert Johnson, B.S., M.S., Ph.D.
Dean, The William States Lee College of Engineering

Harry John Leamy, B.S., Ph.D.
Associate Dean and Director, Cameron Applied Research Center

David Thomas Young, B.S.C.E., M.S.C.E., Ph.D.
Chair, Department of Civil Engineering

Zbigniew Michalewicz, M.Sc., Ph.D.
Chair, Department of Computer Science

Farid Michel Tranjan, B.S., M.S., Ph.D.
Chair, Department of Electrical and Computer Engineering

Cheng Liu, B.S.C.E., M.S.C.E., P.E.
Chair, Department of Engineering Technology

Jayaraman Raja, B.E., M.Sc., Ph.D.
Interim Chair, Department of Mechanical Engineering and Engineering Science

Mirsad Hadzikadic, B.S., M.S., Ph.D.
Acting Director, School of Information Technology

Sue M. Bishop, B.S.N., M.S.N.,Ph.D.
Dean, College of Nursing and Health Professions

Leslie C. Hussey, A.D.N., B.S.N., M.S.N., Ph.D.
Chair, Department of Adult Health Nursing

William K. Cody, A.S.N., B.S.N., B.S., M.S.N., Ph.D.
Chair, Department of Family and Community Nursing, and Associate Dean

J. Timothy Lightfoot, B.S., M.Ed., Ph.D.
Chair, Department of Health Promotion and Kinesiology

Business Affairs

Olen B. Smith, Jr., B.S., M.B.A
Vice Chancellor

Elizabeth A. Hardin, B.B.A., M.B.A.
Associate Vice Chancellor for Business and Planning Analysis

Susan Brooks, B.S., M.B.A.
Associate Vice Chancellor, Finance

John R. Sprouse, Jr., B.S., M.S., P.E., CFM
Interim Accociate Vice Chacenllor, Facilities Management

Gary W. Stinnett, B.Ed., M.A.
Director, Human Resources

Anthony Purcell, B.A., M.S.
Director, Police and Public Safety

James H. Houston, B.S.
Director, Purchasing

Randall C. Ross, B.S., C.P.A.
Director, Internal Audit

Barry Godlewski, B.A.
Director, Systems Development

B.R. Norris, B.S.
Controller

Sherrie High, B.S., C.P.A.
Budget Officer

Sharon L. Kiser, B.S.
Sponsored Programs Financial Manager

Charles G. Rust, B.S., P.E.
Director, Planning and Construction

David M. Morton
Director, Engineering and Planning

Charles R. Puckett, B.B.A.
Director, Maintenance and Operations

Tracy E. Dougherty, B.S.
Administrative Officer

Martin D. Zimmerman, B.Arch., M.C.P.
Facilities Planning and Architectural Management

Michael W. Long, B.A.
Director, Telecommunications

Dempsey Pollard, B.S., CBMI
Director, Auxiliary Services

Charles W. Seigler, B.S., M.A.
Safety Director

Development And University Relations

Thomas A. Martz, B.S.
Vice Chancellor for Development and University Relations

Jack E. Claiborne, B.A., M.A.
Associate Vice Chancellor, University Relations

vacant
Associate Vice Chancellor, Development

Nora K. Manuele, B.A.
Director, Development for Operations

Jean Long, B.A.
Director, Development for Planned Giving

Deirdre Martin, B.A., M.P.A.
Director, Development for Annual Giving

Morgan Roseborough, B.S., M.E.
Director, Alumni Affairs

Bobby Prince, B.A.
Director of Development for Fundraising Staff

Vivian M. Fogle, B.A.
Director, Printing and Publications

Student Affairs

Charles F. Lynch, B.A., M.Ed.
Vice Chancellor

Theodore W. Elling, B.A., M.S., Ed.D.
Assistant Vice Chancellor

Brenda J. Richardson, B.S., M.Ed., Ed.D.
Associate Vice Chancellor and Dean of Students

Michele M. McManus, B.S., M.Ed.
Associate Dean of Students

J. Randall McWhorter, B.S., M.Ed.
Assistant Dean of Students

Stephen C. Hunt, B.A., M.A.
Assistant Dean of Students

Angela M. Haigler, B.A., M.S.
Assistant Dean of Students

Ronald B. Simono, B.S., M.S., Ph.D.
Director, Counseling and Health Services

James A. Mallinson, Jr., B.A., M.A.
Director, Student Health Services

Keith N. Wassum, B.A., M.B.A.
Associate Vice Chancellor for Student Life and Facilities Management

James M. Hoppa, B.S., M.S.
Director, Cone University Center

Marcia Kennard Kiessling, B.A., M.S.
Director of Student Activities

Daniel T. Murray, B.S., M.B.A.
Director, Recreational Facilities Management

Kelly A. Weatherman, B.A., M.A.
Director, Conference Reservations and Event Services

Arthur A. Kohn, A.B., B.A., M.Ed.
Director, Venture

Wayne Maikranz, B.A., M.A.
Student Media Adviser

Terrie V. Houck, B.S., M.Ed.
Director, Intramural & Recreational Services

Roy R. Fielding, B.A., M.Ed.
Aquatics Director

Curtis R. Whalen, B.S., M.Ed.
Director, Student Financial Aid

Jacklyn A. Simpson, B.S., M.Ed.
Associate Vice Chancellor for Housing and Residence Life

Frank Fleming, B.S., M.Ed.
Associate Director, Business Services, Housing and Residence Life

The following persons are employed by various denominations and churches and are present on campus to serve the spiritual needs of the University community:

Daniel McClintock, B.A., M. Div.
Baptist

Martin Schratz
Catholic

Stephen Cheyney
Methodist/Presbyterian/Lutheran

William H. Hinson, B.A., M. Div.
Episcopal

THE GRADUATE FACULTY

Molly Corbett Broad (1998), *President, The University of North Carolina*, B.S., Syracuse University; M.S., Ohio State University

James H. Woodward (1989), *Chancellor, The University of North Carolina at Charlotte, and Professor of Civil Engineering*, B.S.A.E., M.S.A.E., Ph.D., Georgia Institute of Technology; M.B.A., The University of Alabama at Birmingham

Falih Ahmed (1999), *Professor of Engineering Technology*, M.S., Ph.D., Mississippi State University

Yildirim Aktas (1989), *Associate Professor of Physics*, B.S., Middle East Technical University; Ph.D., University of Missouri at Columbia

Robert Francis Algozzine (1988), *Professor of Education, Department of Educational Administration, Research, and Technology*, B.S., Wagner College; M.S., State University of New York at Albany, Ph.D., Pennsylvania State University

Craig James Allan (1992), *Associate Professor of Geography and Earth Sciences*, B.Sc., University of Manitoba; M.Sc., Trent University; Ph.D., York University

Charles Michael Allen (1974), *Professor of Computer Science*, B.S.E.E., M.S.E.E., Carnegie Mellon Institute; Ph.D., State University of New York at Buffalo

Christie Hawkins Amato (1978), *Professor of Marketing*, B.S., University of Tennessee; M.S., Ph.D., University of Alabama

Louis Amato (1980), *Professor of Economics*, A.B., Lenoir-Rhyne College; M.A., University of North Carolina at Greensboro; Ph.D., University of South Carolina

Elizabeth T. Anderson (1978), *Adjunct Lecturer in Medical Technology*, B.A., University of North Carolina at Greensboro; M.A., University of North Carolina at Charlotte

Robert Frank Anderson (1983), *Associate Professor of Mathematics*, B.S., M.S., Iowa State University; Ph.D., University of Minnesota

Theodore Self Arrington (1973), *Interim Chair, Department of Political Science and Professor of Political Science*, B.A., University of New Mexico; M.A., Ph.D., University of Arizona

James Ben Asbel (1989), *Associate Professor of Architecture*, B.A., Kalamazoo College; M.Arch, Harvard University

Carl R. Ashbaugh (1991), *Professor of Education, Department of Educational Administration, Research, and Technology*, A.A., Graceland College; B.S., Ohio University; M.Ed., Miami University; Ph.D., Ohio State University

Robert H. Audette (1989), *Interim Chair, Department of Reading and Elementary Education, and Associate Professor of Education*, B.A., Fitchburg State College; M.A., Ph.D., George Peabody College

Judy Root Aulette (1986), Associate *Professor of Sociology and Adjunct Associate Professor of Women's Studies*, B.A., M.A., Wayne State University; Ph.D., Michigan State University

Joel David Avrin (1984), *Professor of Mathematics*, A.B., M.A., Ph.D., University of California at Berkeley

Haldun Aytug (1996), *Associate Professor of Information Operations Management*, B.S., Bogazici University; Ph.D., University of Florida

Mario Joaquim Azevedo (1986), *Chair, Department of African-American and African Studies, Frank Porter Graham Professor of African-American and African Studies*, B.A., Catholic University of America; M.A., American University; Ph.D., Duke University

Alan H. Bacot (1997), *Associate Professor of Political Science*, B.A., University of North Carolina at Chapel Hill; M.P.A., University of North Carolina at Charlotte; Ph.D., University of Tennessee

Lawrence Samuel Barden (1974), *Professor of Biology*, B.S., Hendrix College; M.S., University of Maine; Ph.D., University of Tennessee

Frank Carey Barnes (1973), *Professor of Operations Management*, B.I.E., Georgia Institute of Technology; M.B.A. Ph.D., Georgia State University

Robert Latta Barret (1979), *Professor of Education, Department of Counseling, Special Education, and Child Development*, B.A., Rhodes College; M.A.T., Vanderbilt University; M.Ed., University of North Carolina at Charlotte; Ph.D., Georgia State University

David Paul Bashor (1971), *Assistant Professor of Biology*, B.S., Ph.D., Florida State University

John R. Beattie, Jr. (1983), *Assistant Professor of Education, Department of Counseling, Special Education, and Child Development*, B.A., M.Ed., University of Virginia; Ph.D., University of Florida

Joyce Marie Beggs (1989), *Associate Professor of Management*, B.S., Concord College; M.A., Marshall University; M.B.A., West Virginia College of Graduate Studies; Ph.D., University of Tennessee

Ella Edmondson Bell (1996), *Associate Professor of Management*, B.A., M.A., Columbia University; Ph.D., Case Western Reserve University

John Francis Bender (1982), *Professor of Earth Sciences*, B.S., State University of New York at New Paltz; M.S., Pennsylvania State University; Ph.D., State University of New York at Stony Brook

Nelson Speer Benzing, Jr. (1979), *Associate Professor of Architecture*, B.S., B.Arch., Georgia Institute of Technology; M.Arch., Pratt Institute

Linda Sloan Berne (1978), *Professor of Health Promotion and Kinesiology*, B.S., Mars Hill College; M.A.T., Ed.D, University of South Carolina

Surasakdi Bhamornsiri (1978), *Associate Professor of Accounting*, B.S., M.B.A., Middle Tennessee State University; D.B.A., University of Tennessee; C.P.A

Richard O. Bierregaard, Jr. (1994), *Adjunct Assistant Professor of Biology*, B.S., Yale University; Ph.D., University of Pennsylvania

Sue Marquis Bishop (1992), *Dean, College of Nursing and Health Professions, and Professor of Nursing*, B.S.N., Murray State University; M.S.N., Ph.D., Indiana University

Michele Bissiere (1990), *Associate Professor of French*, M.A., Ph.D., University of Wisconsin at Madison

Beth E. Bjerregaard (1992), *Associate Professor of Criminal Justice*, B.S., M.S., Kent State University; Ph.D., State University of New York at Albany

Lloyd Blenman (1999), *Associate Professor of Finance and Business Law*, B.Soc.Sc., University of Guyana; M.A., University of Western Ontario; Ph.D., Ohio State University

Anita N. Blowers (1989), *Associate Professor of Criminal Justice*, B.A., M.A., and Ph.D., State University of New York at Albany

Stephen Michael Bobbio (1993), *Professor of Electrical Engineering*, B.S., University of Detroit; Ph.D., College of William and Mary

Andy Russell Bobyarchick (1983), *Associate Professor of Earth Sciences*, B.S., Birmingham-Southern College; M.S., Virginia Polytechnic Institute and State University; Ph.D., State University of New York at Albany

Charles D. Bodkin (1991), *Associate Professor of Marketing*, B.B.A., University of Notre Dame; M.B.A., University of North Carolina at Greensboro; Ph.D., Virginia Polytechnic Institute and State University

Kathleen Underman Boggs (1984), *Associate Professor of Nursing*, B.S.N., Niagara University; M.S.N., Ph.D., University of Maryland

Christiane Bongartz (1999), *Assistant Professor of English*, B.A., University of Cologne; Ph.D., University of Wisconsin, Madison

Rosemary Booth (1991), *Associate Professor of Management, and Adjunct Assistant Professor of Women's Studies*, B.A., Marquette University; M.B.A., Iona College; Ph.D., University of Kentucky

Deborah Sue Bosley (1989), *Director, University Writing Programs, and Associate Professor of English*, B.A., M.A., University of Illinois; Ph.D., Illinois State University

Kenneth L. Bost (1998), *Belk Distinguished Professor of Biology*, B.S., University of North Carolina at Chapel Hill; Ph.D., University of Mississippi Medical Center

James Douglas Bowen (1996), *Assistant Professor of Civil Engineering Technology*, B.A., Duke University; M.S., Vanderbilt University; Ph.D., Massachusetts Institute of Technology

Dana B. Bradley (1997), *Assistant Professor of Political Science*, B.A., University of Rochester; M.S., Ph.D., Carnegie-Mellon University

William Pew Brandon (1994), *Metrolina Medical Foundation Distinguished Professor of Public Policy on Health and Professor of Political Science*, B.A., Johns Hopkins University; M.Sc., University of London; M.P.H., University of North Carolina at Chapel Hill; Ph.D., Duke University

Lilian B. Brannon (1998), *Professor of English, and Professor of Education, Department of Middle, Secondary and K-12 Education*, B.A., Converse College; M.A., Sam Houston State University; Ed.D., Texas A & M University, Commerce

Edwin Rollin Braun (1988), *Associate Professor of Engineering Technology*, B.S., St. Louis University; M.S., Polytechnic Institute of Brooklyn

Lessell Bray (1998), *Assistant Professor of Education, Department of Educational Administration, Research and Technology*, B.S., M.L.S., Appalachian State University; M.S., Ph.D., Indiana University

Sarah D. Breedin (1996), *Assistant Professor of Psychology,* B.S., Georgetown University; M.A., Ph.D., Rice University

Markus Breitschmid (1998), *Clinical Assistant Professor of Architecture,* B.Arch., Swiss Central Institute of Technology; M.A., Virginia Polytechnic Institute and State University; Ph.D., Technical University of Berlin

Pauline G. Brennan (1997), *Lecturer in Criminal Justice,* B.A., M.A., Ph.D., State University of New York at Albany

Dale Arthur Brentrup (1989), *Associate Professor of Architecture,* B.Arch, Arizona State University; M.Arch, University of California

William Morris Britt (1972), *Professor of Education, Department of Middle, Secondary, and K-12 Education,* B.S., Western Carolina University; M.Ed., University of North Carolina at Chapel Hill; Ed.D., University of Tennessee

Diane Browder (1998), *Lake and Edward J. Snyder Distinguished Professor of Special Education, Department of Counseling, Special Education and Child Development,* B.A., Duke University; M.Ed., Ph.D., University of Virginia

Banita White Brown (1988), *Associate Professor of Chemistry,* B.S., Furman University; Ph.D., University of Miami

Cheryl Luvenia Brown (1982), *Associate Professor of Political Science,* B.A., University of Florida; M.A., Ph.D., University of Michigan

Mary Maureen Brown (1994), *Associate Professor of Political Science,* B.S., University of Maryland; M.P.A., University of Oklahoma; D.P.A., University of Georgia

Roger Glenn Brown (1985), *Senior Associate Provost for Academic Affairs, and Professor of Political Science,* B.A., M.A., University of Tennessee at Knoxville; Ph.D., Johns Hopkins University

Kimberly Ann Buch (1987), *Associate Professor of Psychology,* B.S., M.A., Western Kentucky University; Ph.D., lowa State University

Jurgen Buchenau (1998), *Assistant Professor of History,* B.A., University of Cologne; M.A., Ph.D., University of North Carolina at Chapel Hill

Harry Timothy Bulow, (1992), *Assistant Professor of Music,* B.A., San Diego State University; M.A., Ph.D., University of California at Los Angeles

Mary Thomas Burke (1970), *Professor of Education, Department of Counseling, Special Education, and Child Development,* B.A., Belmont Abbey College; M.A., Georgetown University; Ph.D., University of North Carolina at Chapel Hill

Charles Alan Burnap (1982), *Associate Professor of Mathematics,* B.S., Rensselaer Polytechnic Institute; A.M., Ph.D., Harvard University

Hughlene A. Burton (1996), *Assistant Professor of Accounting,* B.S., Wake Forest University; Ph.D., The University of Alabama

Stewart Fowler Bush (1969), *Professor of Chemistry,* A.B., Erskine College; Ph.D., University of South Carolina

Wei Cai (1989), *Professor of Mathematics,* B.S., M.S., University of Science and Technology of China; M.S., Ph.D., Brown University

Zongwu Cai (1998), *Assistant Professor of Mathematics,* B.S., China University of Geosciences; M.S., Hangzhou University; Ph.D., University of California, Davis

Lawrence Gibson Calhoun, Jr. (1973), *Professor of Psychology,* B.A., St. Andrews Presbyterian College; M.A., Xavier University; Ph.D., University of Georgia

Mary Lynne Calhoun (1982), *Interim Dean, College of Education, and Professor of Education,* A.B., Randolph-Macon Woman's College; M.Ed., Ph.D., University of Georgia

Gerald Edward Calvasina (1982), *Associate Professor of Management,* B.B.A., M.B.A., Ph.D., University of Mississippi

Harrison S. Campbell, Jr. (1996), *Assistant Professor of Geography,* B.A., Clark University; M.A., Ph.D., University of Illinois at Urbana-Champaign

Arnold Augustus Cann, Jr. (1975), *Professor of Psychology,* B.A., Northeastern University; Ph.D., Indiana University

Clifford M. Carlin (1990), *Lecturer in Chemistry,* B.S., Ph.D., North Carolina State University at Raleigh

Kelly Jean Carlson-Reddig (1992), *Associate Professor of Architecture,* B.Arch., Texas Tech University; M.E.Des., Yale University

Claudio Carpano (1990), *Associate Professor of Management,* D.P., State University of Rome; M.B.A., Southeastern Louisiana University; Ph.D., University of South Carolina at Columbia

Barbara Anne Carper (1989), *Associate Dean for Academic Affairs, College of Nursing and Health Professions, and Professor of Nursing,* B.S., Texas Woman's University; M.Ed., Ed.D, Columbia University

Jane K. Carrigan (1997), *Associate Professor of Education, Department of Educational Administration, Research and Technology*, B.A., M.Ed., University of North Carolina at Charlotte; Ed.S., Appalachian State University; Ed.D., University of North Carolina at Greensboro

Jane Judy Carroll (1995), *Assistant Professor of Education, Department of Counseling, Special Education, and Child Development*, B.S., University of Maine; M.S., Florida Institute of Technology; Ed.S., M.Ed., Ph.D., University of Florida

Jack Miller Cathey (1988), *Graduate Coordinator and Associate Professor of Accounting*, B.S., Wake Forest University; M.S., Ph.D., Virginia Polytechnic Institute and State University; C.P.A.

Rosemary Chaudry (1997), *Senior Resident Associate Professor of Political Science*, B.S.N., Adelphi University; M.H.A., M.S., Ph.D., The Ohio State University

Keh-Hsun Chen (1978), *Associate Professor of Computer Science*, B.S., Taiwan Cheng-Kung University; M.S., National Tsing Hua University; Ph.D., Duke University

Bei-Tseng Bill Chu (1988), *Professor of Computer Science*, B.S., M.S., Ph.D., University of Maryland

Victor Vincent Cifarelli (1995), *Assistant Professor of Mathematics*, B.S., University of Connecticut; M.S., Ph.D., Purdue University

Anna Kirsten Clark (1988), *Professor of History, and Adjunct Professor of Women's Studies*, B.A., Harvard University; M.A., University of Essex; Ph.D., Rutgers University

Andrea Clatworthy (1998), *Assistant Residence Professor of Biology*, Ph.D., University of Wales

Mark G. Clemens (1996), *Chair, Department of Biology, and Professor of Biology*, B.S., Ph.D., St. Louis University

William Kershaw Cody (1992), *Chair, Department of Family and Community Nursing, and Associate Professor of Nursing*, A.S.N., B.S.N., University of the State of New York; B.S., New York University; M.S.N., Hunter College, City University of New York; Ph.D., University of South Carolina

Robin Noelle Coger (1996), *Assistant Professor in Mechanical Engineering*, B.S., Cornell University; M.S., Ph.D., University of California

Richard Alan Cohen (1994), *Isaac Swift Distinguished Professor of Judaic Studies and Professor of Religious Studies*, B.A., Pennsylvania State University; M.A., Ph.D., State University of New York at Stony Brook

Richard Monroe Conboy (1970), *Associate Dean, Belk College of Business Administration, and Associate Professor of Management*, B.S.B.A., Old Dominion University; M.B.A., Ph.D., Virginia Polytechnic Institute and State University

John Edward Connaughton (1978), *Graduate Coordinator and Professor of Economics*, B.A., Boston State College; M.A., Ph.D., Northeastern University

Paula T. Connolly (1991), *Associate Professor of English, and Adjunct Assistant Professor of Women's Studies*, A.B., M.A., Boston College; Ph.D., University of Massachusetts at Amherst

James Richard Cook (1980), *Associate Professor of Psychology*, A.B., Ph.D., Indiana University

Nancy L. Cooke (1984), *Associate Professor of Education, Department of Counseling, Special Education, and Child Development*, B.S., M.A., Ph.D., The Ohio State University

Brian T. Cooper (1997), *Assistant Professor of Chemistry*, B.S., Purdue University; Ph.D., University of Arizona

William Douglas Cooper (1985), *Professor of Operations Management*, B.S., M.S., Ph.D., North Carolina State University at Raleigh

Michael Frederic Cornick (1985), *Associate Professor of Accounting*, B.S., Purdue University; M.B.A., Ph.D., University of North Carolina at Chapel Hill; C.P.A.

Thomas Michael Corwin (1974), *Chair, Department of Physics, and Professor of Physics*, B.S., Tulane University; M.S., Johns Hopkins University; Ph.D., Georgia Institute of Technology

Charisse TiaMaria Coston (1992), *Associate Professor of Criminal Justice*, A.A., Ohio University; B.S., University of Cincinnati; M.A., Ph.D., Rutgers, the State University of New Jersey

Marvin Joseph Croy (1980), *Associate Professor of Philosophy*, B.A., Ph.D., Florida State University

Kent Edward Curran (1984), *Professor of Management*, B.S.M.E., M.B.A., Bradley University; D.B.A., Louisiana State University

Mary Alyce Curran (1984), *Associate Professor of Nursing*, B.S.N., University of South Alabama; M.S.N., University of Tennessee; Ph.D., Vanderbilt University

James F. Cuttino (1999), Professor of Mechanical Engineering, B. S., M. S., Clemson University; Ph. D., North Carolina State University

Teresa Abi-Nader Dahlberg (1995), *Assistant Professor of Electrical Engineering*, B.S., University of Pittsburgh; M.S., Ph.D., North Carolina State University at Raleigh

Xingde Dai (1990), *Associate Professor of Mathematics,* B.A., Fudan University; China; M.S., Zhejiang University; M.S., University of Nebraska; Ph.D., Texas A&M University

Louis Gilbert Daignault (1982), *Associate Professor of Chemistry,* B.S., Clarkson College of Technology; Ph.D., University of Rochester

Kasra Daneshvar (1987), *Professor of Electrical Engineering,* B.S., Louisiana State University; M.S., Ph.D., University of Illinois

Rachel A. Davidson (1998), *Assistant Professor of Civil Engineering,* Ph.D., Stanford University

Boyd Hill Davis (1970), *Bonnie E. Cone Distinguished Professor of Teaching, and Professor of English,* B.A., University of Kentucky; M.A., Ph.D., University of North Carolina at Chapel Hill

David Christopher Davis (1989), *Associate Professor of English,* B.A. Syracuse University; M.F.A., University of

William Young Davis, Jr. (1970), *Professor of Economics,* B.A., Furman University; Ph.D., University of Georgia

Charles William Dean (1982), *Professor of Criminal Justice,* B.A., Asbury College; M.A., Ph.D., University of Illinois

Betty Dennis (1997), *Associate Professor of Nursing,* B.S., A & T State University; M.S.N., Emory University; Ph.D., University of North Carolina at Chapel Hill

Harshini V. de Silva (1993), *Associate Professor of Biology,* B.S., Wichita State University; M.S., University of Kansas; Ph.D., University of Cincinnati

Yuanan Diao (1996), *Visiting Associate Professor of Mathematics,* B.S., Wuhan University; M.S., Beijing University; Ph.D., Florida State University

Warren J. Di Biase (1997), *Assistant Professor of Education, Department of Middle, Secondary and K-12 Education,* B.S., B.S.Ed., Ohio University; M.S.Ed., Youngstown State University; Ed.D., West Virginia University

John Andrew Diemer (1988), *Associate Professor of Geography and Earth Sciences,* B.A., Oberlin College; M.A., Ph.D., State University of New York at Binghamton

Rita DiGioacchino (1998), *Assistant Professor of Health Promotion & Kinesiology,* B.A., State University of New York at Geneseo; M.P.H., Ph.D., University of South Carolina

Carol Ann Dole (1993), *Assistant Professor of Economics,* B.S., University of Florida; M.B.A., University of Cincinnati; M.S., Ph.D., University of Florida

Kathleen Grace Donohue (1995), *Assistant Professor of History,* B.A., M.A., Florida State University; Ph.D., University of Virginia

Bernadette T. Donovan-Merkert (1992), *Associate Professor of Chemistry,* B.S., Duke University; Ph.D., University of Vermont

Mark Dorfman (1998), *Distinguished Professor in Insurance,* B.S., Northwestern University; M.S., Ph.D., University of Illinois, Urbana-Champaign

Patricia A. Douville (1996), *Clinical Assistant Professor of Education, Department of Reading and Elementary Education,* B.A., University of North Carolina at Wilmington; M.A.Ed., East Carolina University; Ph.D., North Carolina State University

Michael Scott Doyle (1993), *Chair, Department of Languages and Cultural Studies, and Professor of Spanish,* B.A., University of Virginia; M.A., Universidad de Salamanca; Ph.D., University of Virginia

Thomas David DuBois (1967), *Charles H. Stone Professor of Chemistry,* B.A., McMurry College; M.S., Ph.D., Ohio State University

James R. Dudley (1991), *Professor of Social Work,* B.S., M.S.W., University of Illinois: Ph.D., Bryn Mawr College

Daniel Stuart Dupre (1989), *Associate Professor of History,* B.A., Macalester College; Ph.D., Brandeis University

Arthur Henry Edwards (1989), *Associate Professor of Electrical Engineering,* B.S., M.S., Ph.D., Lehigh University

Barbara Ann Edwards (1976), *Chair, Department of Reading and Elementary Education, and Associate Professor of Education,* B.S., Kent State University; M.A., Ph.D., University of South Florida

Lienne Deshaies Edwards (1982), *Assistant Professor of Nursing,* B.S.N., University of North Carolina at Chapel Hill; M.S.N., Ph.D., University of North Carolina at Greensboro

Essam El-Kwae (1999), *Professor of Computer Science,* M.S., Alexandria University, Ph.D., University of Miami

Michael D. Ensley (1997), *Assistant Professor of Management,* B.S.B.A., M.B.A., Western Carolina University; A.B.D., Mississippi State University

Horacio Vazquez Estrada (1983), *Associate Professor of Engineering Science,* B.S., University of Guadalajara; M.S., National Institute of Mexico; Ph.D., Rensselaer Polytechnic Institute

Jack Burnie Evett (1967), *Professor of Civil Engineering*, B.S., M.S., University of South Carolina; Ph.D., Texas A & M University; P.E.

Faramarz Farahi (1990), *Professor of Physics*, B.S., Aryamehr University; M.S., University of Southampton; Ph.D., University of Kent

Michael Robert Feldman (1989), *Associate Professor of Electrical Engineering*, B.S., Duke University; M.S., Ph.D., University of California

Charles Denton Fernald (1971), *Associate Professor of Psychology*, B.S., University of Massachusetts; Ph.D., Indiana University

Janet A. Finke (1993), *Associate Professor of Education, Department of Reading and Elementary Education*, B.A., Washington State University; M.Ed., Ph.D., University of Illinois at Urbana-Champaign

John Flower (1996), *Assistant Professor of History*, B.A., Haverford College; M.A., University of Virginia

Claudia Paisley Flowers (1995), *Assistant Professor of Education, Department of Educational Administration, Research, and Technology*, B.S., West Georgia College; M.Ed., Ph.D., Georgia State University

Sondra Joanne Fogel (1994), *Associate Professor of Social Work*, B.A., State University of New York at Buffalo; M.S.W., Columbia University; Ph.D., University of Illinois at Urbana-Champaign

Paul W. Foos (1991), *Professor of Psychology*, B.A., M.A., Ph.D., Bowling Green State University

Thomas Robert Forrest (1973), *Associate Professor of Sociology*, B.S., University of Wisconsin; M.A., Ph.D., Ohio State University

Amy Forsyth (1997), *Assistant Professor of Architecture*, B.A., Pennsylvania State University; M.A., Princeton University

Randall D. Forsythe (1989), *Associate Professor of Earth Sciences*, B.A., Lawrence University; M.A., M.Phil, Ph.D., Columbia University

Gwendolyn Foss (1998), *Assistant Professor of Nursing*, B.S.N., University of Washington; M.S.N., Wayne State University; D.N.Sc., University of San Diego

Alan Freitag (1998), *Assistant Professor of Communication Studies*, B.S., University of Wisconisn, Oshkosh; M.A., Webster University; Ph.D., Ohio University

Paul C. Friday (1992), *Professor of Criminal Justice*, B.A., Drew University; M.A., Ph.D., University of Wisconsin

Elise M. Fullmer (1992), *Associate Professor of Social Work*, B.S., M.S.W., University of Utah; Ph.D., State University of New York at Albany

Susan Renee Furr (1980), *Assistant Professor of Education, Department of Counseling, Special Education, and Child Development*, B.A., University of North Carolina at Greensboro; M.A., Wake Forest University; Ph.D., University of North Carolina at Chapel Hill

Owen J. Furuseth, Jr. (1977), *Professor of Geography and Earth Sciences*, B.A., M.A., East Carolina University; Ph.D., Oregon State University

Donna Gabaccia (1991), *Charles H. Stone Professor of American History*, B.A., Mount Holyoke College; M.A., Ph.D., University of Michigan

Shelagh Ann Gallagher (1995), *Assistant Professor of Education, Department of Counseling, Special Education, and Child Development*, B.A., University of North Carolina at Chapel Hill; M.A., University of Arizona; Ph.D., University of North Carolina at Chapel Hill

John Maxim Gandar (1982), *Associate Professor of Economics*, B.A., Massey University; M.A., Victoria University; M.A., Ph.D., University of Missouri-Columbia

Susan Jane Gardner (1990), *Associate Professor of English*, B.A., Macalester College; M.A., University of Wisconsin; Ph.D., Rhodes University

Hallie Leon Gatlin, III (1966), *Associate Professor of English*, B.A., Wake Forest College; M.A., Ph.D., University of Iowa

Jane F. Gaultney (1992), *Associate Professor of Psychology*, B.A., Palm Beach Atlantic College; M.A., Ph.D., Florida Atlantic University

William Carroll Gay (1980), *Chair, Department of Philosophy, and Professor of Philosophy*, B.A., Carson-Newman College; Ph.D., Boston College

Ioan Gergely (1998), *Assistant Professor of Civil Engineering*, Dipl.Ing., Technical Institute of Cluj-Napoca; M.Sc., Ph.D., University of Utah

Ronald Arthur Gestwicki (1972), *Associate Professor of Religious Studies*, B.A., University of Buffalo; M.Div., General Theological Seminary; Ph.D., Syracuse University

Lorine M. Getz (1989), *Associate Professor of Religious Studies*, B.S.Ed., Duquesne University; M.A., University of Dayton; Ph.D., University of St. Michael's College

Virginia Shaw Geurin (1972), *Associate Dean for Graduate Studies and Research, Belk College of Business Administration, Interim Chair, Department of Management, and Professor of Management,* B.S., B.A., M.B.A., Ph.D., University of Arkansas

Robert A. Giacalone (1997), *Surtman Distinguished Professor of Business Ethics,* B.A., Hofstra University; Ph.D., State University of New York at Albany

Edward Giess (1992), *Adjunct Professor of Electrical Engineering,* B.S., M.S., Ph.D., Alfred University

David Clark Gilmore (1979), *Associate Professor of Psychology,* B.A., Capital University; M.A., Ph.D., Ohio State University

Robert Milnor Gleaves (1969), *Associate Professor of Spanish,* B.A., David Lipscomb College; M.A., Ph.D., Vanderbilt University

Lon Howard Godfrey (1975), *Chair, Department of Accounting, and Professor of Accounting,* B.S., Mississippi College; M.Acc., University of Mississippi; Ph.D., University of Alabama; C.P.A.

David Reed Goldfield (1982), *Robert Lee Bailey Professor of History,* B.A., Brooklyn College; M.A., Ph.D., University of Maryland

Ann Brashear Gonzalez (1990), *Associate Professor of Spanish,* B.A., University of North Carolina at Chapel Hill; M.A., Ph.D., University of South Carolina at Columbia

John S. Gooden (1997), *Associate Professor of Education, Department of Educational Administration, Research and Technology,* B.A., Delaware State University; M.A., City College of New York; Ed.D., University of Massachusetts

Paula Ann Goolkasian (1974), *Professor of Psychology,* B.A., Emmanuel College; M.A., Ph.D., Iowa State University

Sandra Yvonne Govan (1983), *Professor of English,* B.A., Valparaiso University; M.A., Bowling Green State University; Ph.D., Emory University

Johnny Rufus Graham (1984), *Associate Professor of Civil Engineering,* B.S.E., M.S.E., University of North Carolina at Charlotte; Ph.D., North Carolina State University at Raleigh

Lee Edward Gray (1990), *Associate Professor of Architecture,* B.A., Iowa State University; M.Arch, University of Virginia; Ph.D., Cornell University

Michael George Green (1978), *Associate Professor of Education, Department of Reading and Elementary Education,* B.A., University of California at Berkeley; Ed.M., Ed.D, Harvard University

Arthur Greenberg (1994), *Chair, Department of Chemistry, and Professor of Chemistry,* B.A., Fairleigh Dickinson University; M.S., Ph.D., Princeton University

Richard Frank Greene (1988), *Professor of Electrical Engineering,* B.S., Lehigh University; Ph.D., University of Pennsylvania

John Alexander Gretes (1982), *Professor of Education, Department of Educational Administration, Research, and Technology,* B.S., M.S., Old Dominion University; Ed.D, University of Virginia

Robert Waters Grey (1969), *Associate Professor of English,* A.B., Brown University; M.A., University of Virginia

Douglas Lee Grimsley (1970), *Professor of Psychology,* B.S., Florida State University; Ph.D., Syracuse University

Dale Allan Grote (1992), *Associate Professor of Classics,* B.A., Cornell College; M.A., University of Iowa; Ph.D., University of Wisconsin-Madison

Robert Earl Guinn (1976), *Associate Professor of Accounting,* B.A., Carson-Newman College; M.A., Ph.D., University of Alabama; C.P.A.

Mirsad S. Hadzikadic (1987), *Chair, Department of Computer Science, and Associate Professor of Computer Science,* B.S., M.S., University of Banja Luka; Ph.D., Southern Methodist University

Gloria Ann Hagopian (1993), *Professor of Nursing,* B.S.N., M.S.N., Ed.D., University of Rochester

Dawson R. Hancock (1994), *Assistant Dean, College of Education, and Clinical Assistant Professor of Education,* B.S., United States Military Academy; M.Ed., M.A., University of North Carolina at Chapel Hill; Ph.D., Fordham University

Sonya R. Hardin (1998), *Assistant Professor of Nursing,* B.S.N., M.S.N., University of North Carolina at Charlotte; M.B.A., M.H.A., Pfeiffer College; Ph.D., University of Colorado Health Sciences Center

Yogeshwar Hari (1978), *Associate Professor of Mechanical Engineering,* B.S.M.E., Punjab University; M.S.M.E., Ph.D., Purdue University; P.E.

David T. Hartgen (1989), *Professor of Geography and Earth Sciences,* B.S, Duke University; M.S., Ph.D., Northwestern University

Andrew R. Harver (1991), *Associate Professor of Psychology,* B.S., University of Washington; M.S., Ph.D., Ohio University

Mohamed-Ali Hasan (1995), *Associate Professor of Electrical Engineering*, M.S., Ph.D., Linkoping Institute of Technology

Frances Hawthorne (1996), *Lecturer in Art*, B.A., B.C.A., The University of North Carolina at Charlotte; M.F.A., Winthrop University

Kingston William Heath (1987), *Associate Professor of Architecture*, A.B., Lake Forest College; A.M., University of Chicago; A.M., Ph.D., Brown University

Charles Clinton Hight (1976), *Dean, College of Architecture, and Professor of Architecture*, B.S.C.E., University of Maryland; B.Arch., Auburn University

Helen Ann Hilger (1993), *Assistant Professor of Civil Engineering*, B.A., Rutgers, The State University; B.S., M.S., University of North Carolina at Charlotte

Bill J. Hill, Jr. (1982), *Chair, Department of Communication Studies, and Professor of Communication Studies*, B.S., Appalachian State University; M.A., Wake Forest University; Ph.D, Florida State University

Robert John Hocken (1988), *Norvin K. Dickerson, Jr., Distinguished Professor of Precision Engineering*, B.A., Oregon State University; M.A., Ph.D., State University of New York at Stony Brook

James K. Hogue (1999), *Assistant Professor of History, Associate Professor of Business Honors*, B.S., United States Military Academy; M.A., Ohio State University; M.A., Ph.D., Princeton University

Walter D. Holder (1991), *Adjunct Professor of Biology*, B.A., M.D., University of North Carolina at Chapel Hill

Rosemary Lynn Hopcroft (1994), *Associate Professor of Sociology*, B.A., University of Mississippi; M.A., Ph.D., University of Washington

Evan Green Houston, Jr. (1974), *Professor of Mathematics*, B.A., Hendrix College; Ph.D., University of Texas at Austin

James M. Hovick (1996), *Assistant Professor of Chemistry*, B.A., Frankling and Marshall College; M.S., Ph.D., University of Michigan

Michael Carl Hudson (1990), *Associate Professor of Biology*, B.A., Boston University; Ph.D., University of Kansas

Yvette Maria Huet-Hudson (1991), *Associate Professor of Biology*, B.A., University of Kansas at Lawrence; Ph.D., University of Kansas Medical Center

John Leonard Huffman (1993), *Professor of Communication Studies*, B.A., Black Hills State College; Ph.D., University of Iowa

Frances Hughes (1998), *Assistant Professor of Biology*, B.S., Clemson University; Ph.D., Medical University of South Carolina

Leslie C. Hussey (1996), *Chair, Adult Health Nursing and Associate Professor of Adult Health Nursing*, A.D.N., B.S.N., Purdue University; M.S.N., Northern Illinois University; Ph.D., University of North Texas

Ira Walter Hutchison, III (1977), *Professor of Sociology*, B.A., Michigan State University; M.A., Ph.D., University of Notre Dame

Gerald Lynn Ingalls (1973), *Professor of Geography*, B.A., University of Southwestern Louisiana; M.A., University of Florida; Ph.D., Michigan State University

Sallie Middleton Ives (1977), *Associate Professor of Geography, and Adjunct Associate Professor of Women's Studies*, B.A., M.A., University of Maryland; Ph.D., University of Illinois

Tony Eugene Jackson (1994), *Associate Professor of English*, B.A., University of South Carolina at Columbia; M.A., University of Oregon; Ph.D., University of California at Los Angeles

Jay Bruce Jacoby (1978), *Interim Chair, Department of Art, Professor of Art, and Professor of English*, B.A., University of Cincinnati; M.A., Villanova University; Ph.D., University of Pittsburgh

Rajaram Janardhanam (1980), *Professor of Civil Engineering*, B.S.E., M.S., Annamalai University; Ph.D., Virginia Polytechnic Institute and State University

Janice K. Janken (1989), *Associate Professor of Nursing*, B.S.N., M.S.N., Ph.D., University of Illinois

Harold Henry Jaus (1987), *Professor of Education, Department of Reading and Elementary Education*, B.S., M.S., Florida State University; Ed.D., Indiana University

Irocus Edward Jernigan III (1989), *Associate Professor of Management*, B.S., Middle Tennessee State University, M.B.A., D.B.A., Memphis State University

Kathryn Virginia Johnson (1988), *Associate Professor of Religious Studies*, B.A., University of North Carolina at Chapel Hill; M.A., Ph.D., Harvard University

Lyman Lucius Johnson (1972), *Professor of History*, B.A., Tufts University; M.A., University of Rhode Island; Ph.D., University of Connecticut

Phillip Eugene Johnson (1971), *Associate Professor of Mathematics*, B.S., Appalachian State University; M.A., George Peabody College; M.A., American University; Ph.D., George Peabody College

Robert Edward Johnson (1994), *Dean, The William States Lee College of Engineering, and Professor of Engineering Science,* B.S., State University of New York at Buffalo; M.S., Ph.D., California Institute of Technology

Susan K. Johnson (1996), *Assistant Professor of Psychology,* B.A., Bowdoin College; M.A., New York University; Ph.D., Rutgers University

Daniel Silas Jones, Jr. (1973), *Associate Professor of Chemistry,* B.S., Wake Forest College; A.M., Ph.D., Harvard University

Irvin R. Jones (1998), *Assistant Professor of Engineering Technology,* B.S., Stanford University; M.S., University of California, Santa Barbara; Ph.D., University of Colorado, Boulder

Jeanneine Petersen Jones (1992), *Associate Professor of Education, Department of Middle, Secondary, and K-12 Education,* B.A., Catawba College; M.Ed., Ed.D, University of North Carolina at Greensboro

Sarah L. Jordan (1997), *Clinical Assistant Professor of Education, Department of Counseling, Special Education and Child Development,* B.S., M.A., East Carolina University; Ph.D., University of Florida

Carole L. Jurkiewicz (1997), *Assistant Professor of Political Science,* B.A., University of Michigan; M.P.A., Ph.D., University of Missouri, Kansas City

Yogendra Purshottam Kakad (1976), *Professor of Electrical Engineering,* B.S., University of Baroda; M.S., Ph.D., University of Florida

Martin Richard Kane (1995), *Assistant Professor of Civil Engineering,* B.S., M.S., Ph.D., Michigan State University

Charles Howard Kaplan (1986), *Associate Professor of Psychology,* B.A., Kent State University; M.A., Ed.M., Ph.D., Columbia University

Laura Duhan Kaplan (1989), *Coordinator, Women's Studies Program, Associate Professor of Philosophy and Adjunct Associate Professor of Women's Studies,* A.B., Brandeis University; M.Ed., Cambridge College; M.A., Claremont Graduate School

Janusz Kawczak (1998), *Assistant Professor in Mathematics,* M.Math., University of Wroclaw; B.Sc., M.Sc., University of Manitoba; Ph.D., University of Western Ontario

Dennis Charles Kay (1995), *Russell M. Robinson II Distinguished Professor of Shakespeare,* B.A., University College, Oxford; M.A., Lincoln College, Oxford; D.Phil, Oxford University

Mohammad-Ali Kazemi (1982), *Professor of Mathematics,* B.S., Pahlavi University; M.S., Arya-Mehr University; Ph.D., University of Michigan

Russell Guy Keanini (1992), *Associate Professor of Mechanical Engineering,* B.S., Colorado School of Mines; M.S., University of Colorado; Ph.D., University of California at Berkeley

William Frederick Kennedy (1978), *Associate Professor of Finance,* B.A., University of Richmond; M.A., Old Dominion University; Ph.D., Virginia Polytechnic Institute and State University

Daryl Lynn Kerr (1988), *Associate Professor of Management,* B.A., University of North Carolina at Charlotte; M.A., University of North Carolina at Chapel Hill; Ph.D., Florida State University

Moutaz J. Khouja (1991), *Associate Professor of Operations Management,* B.S., M.B.A., University of Toledo; Ph.D., Kent State University

Fouad Eskender Kiamilev (1992), *Associate Professor of Electrical Engineering,* B.S., M.S., Ph.D., University of California at San Diego

Cynthia Anne Kierner (1986), *Professor of History,* B.A., McGill University; M.A., Ph.D., University of Virginia

Daniel Kilper (1997), *Assistant Professor of Physics,* B.S., Virginia Polytechnic Institute and State University; M.S., Ph.D., University of Michigan

Ryan Kilmer (1999), *Professor of Psychology,* B.S., University of Washington; M.A., Ph.d,University of Rochester

Rhyn Hyun Kim (1965), *Professor of Mechanical Engineering,* B.S.M.E., Seoul National University; M.S.M.E., Ph.D., Michigan State University; P.E.

Lee Ellis King (1976), *Professor of Civil Engineering,* B.S.C.E., M.C.E., North Carolina State University at Raleigh; D.Eng., University of California at Berkeley; P.E.

Michael V. Klibanov (1990), *Professor of Mathematics,* M.S., Novosibirsk State University; Ph.D., Ural State University; D.S., Novosibirsk State University

Cyril H. Knoblauch, Jr. (1998), *Chair, Department of English, and Professor of English,* B.A., College of St. Thomas; M.A., Ph.D., Brown University

Gary F. Kohut (1983), *Professor of Management,* B.S., M.B.A., Youngsown State University; Ph.D., Southern Illinois University

Joanna K. Krueger (1999), *Assistant Professor of Chemistry,* B.A., Kalamazoo College; M.A., Ph.D., Princeton University

Ram L. Kumar (1993), *Associate Professor of Information and Operations Management*, B.T., Indian Institute of Technology; M.B.A., Indian Institute of Management; Ph.D., University of Maryland at College Park

Reinhold P. Lamb (1990), *Associate Professor of Finance*, B.S., Geneva College; M.B.A., Roosevelt University; Ph.D., Florida State University

Alan Leslie Lambert (1974), *Professor of Mathematics*, B.S., M.S., University of Miami; Ph.D., University of Michigan

Richard G. Lambert (1996), *Clinical Assistant Professor of Education*, B.S., St. Lawrence University; Ed.M., Temple University; Ed.S., Ph.D., Georgia State University

Kenneth Allen Lambla (1983), *Chair of Instruction, College of Architecture, and Associate Professor of Architecture*, B.E.D., University of Kansas; M.Arch., University of California at Berkeley

Larry Michael Lance (1970), *Associate Professeor of Sociology*, B.A., M.A., Bowling Green State University; Ph.D., Purdue University

David Robert Langford (1994), *Associate Professor of Nursing*, A.S., B.S., Brigham Young University; M.S., D.N.Sc., University of California at San Francisco

Pamala Larsen (1999), *Professor of Adult Health Nursing*, B.S., Fort Hays State University; M.S., University of Colorado; Ph.D., University of Northern Colorado

Jeffrey Leak (1998), *Assistant Professor of English*, B.A., Campbell University; M.A., University of Delaware; Ph.D., Emory University

Harry John Leamy (1992), *Associate Dean, The William States Lee College of Engineering, Director, Cameron Applied Research Center, and Professor of Mechanical Engineering and Engineering Science*, and Professor of Physics, B.A., University of Missouri at Rolla; Ph.D., Iowa State University

Larry Jackson Leamy (1988), *Professor of Biology*, B.S., Eastern Illinois University; M.S.. Ph.D., University of Illinois at Urbana-Champaign

Jo Ann Lee (1983), *Associate Professor of Psychology*, A.B., M.S., Ph.D., University of Georgia

Charles Y. Lee (1999), Professor of Mechanical Engineering, B.S., M.S., Ph. D., University of California

Richard W. Leeman (1989), *Professor of Communication Studies*, B.S., Shippensburg State College; M.A., Ph.D., University of Maryland at College Park

Janet E. Levy (1980), *Associate Professor of Anthropology*, A.B., Brown University; M.A., Ph.D., Washington University

J. Timothy Lightfoot (1996), *Chair, Department of Health Promotion and Kinesiology, and Associate Professor of Health Promotion and Kinesiology*, B.S., M.Ed., Northeast Louisiana University; Ph.D., University of Tennessee

Claude C. Lilly, III (1997), *Dean, Belk College of Business Administration, James J. Harris Chair in Insurance, and Professor of Risk Management*, B.B.A., Georgia State College; M.I., Ph.D., Georgia State University

Hwan Chyang Lin (1993), *Associate Professor of Economics*, B.A., National Chung Hsing University; M.S., Ph.D., University of Illinois at Urbana-Champaign

Montserrat Linares (1998), *Assistant Professor of Spanish*, B.S., University of Barcelona; Ph.D., University of Pennsylvania

John Mitchell Lincourt (1973), *Bonnie E. Cone Distinguished Professor of Teaching, Department of Philosophy*, B.A., St. Anselm's College; M.A., Niagara University; Ph.D., State University of New York at Buffalo

Gaines Howard Liner (1971), *Associate Professor of Economics*, B.S., North Carolina State University at Raleigh; M.S., Ph.D., Clemson University

Caroline T. Linse (1997), *Assistant Professor of Education, Department of Middle, Secondary and K-12 Education*, B.A., University of the Pacific; M.A., University of San Francisco; Ed.M., Ed.D., Harvard Graduate School of Education

Corey Robert Lock (1987), *Professor of Education, Department of Middle, Secondary, and K-12 Education*, B.A., University of Kentucky; M.Ed., Miami University; Ph.D., Ohio State University

Junsheng Long (1992), *Associate Professor of Computer Science*, B.S., Beijing University; M.S., University of Arizona; Ph.D., University of Illinois

Jerry Dennis Lord (1970), *Professor of Geography*, B.A., M.A., Ph.D., University of Georgia

Vivian Baumgardner Lord (1994), *Associate Professor of Criminal Justice*, B.A., University of Georgia; M.A., Goddard College; Ph.D., North Carolina State University at Raleigh

Thomas George Lucas (1983), *Professor of Mathematics*, B.S., Oklahoma Baptist University; M.A., Ph.D., University of Missouri-Columbia

Thomas Ramsey Lucas (1969), *Professor of Mathematics*, B.S., University of Florida; M.S., University of Michigan; Ph.D., Georgia Institute of Technology

Vasilije Peter Lukic (1984), *Professor of Electrical Engineering*, B.S.E.E., M.S.E.E., Sc.D., University of Belgrade

Ronald F. Lunsford (1991), *Chair, Department of English, and Professor of English*, B.A., University of North Carolina at Charlotte; M.A., University of North Carolina at Chapel Hill; Ph.D., Florida State University

James Edward Lyons (1979), *Chair, Department of Educational Administration, Research, and Technology, and, Professor of Education*, B.S., Elizabeth City State University; M.A., East Carolina University; Ph.D., Ohio State University

Schley Roosevelt Lyons (1969), *Dean, College of Arts and Sciences, and Professor of Political Science*, B.S., B.A., Shepherd College; M.A., Ph.D., American University

Richard D. McAnulty (1990), *Associate Professor of Psychology*, B.A., Harding University; M.S., Northeast Louisiana University; Ph.D., University of Georgia

James Holt McGavran, Jr. (1973), *Professor of English*, B.A., The College of Wooster; M.A., Columbia University; Ph.D., University of North Carolina at Chapel Hill

Rob Roy McGregor III (1991), *Associate Professor of Economics*, B.A., M.A., Clemson University; Ph.D., University of South Carolina

Robert John MacLean (1981), *Associate Professor of Architecture*, B.Arch., University of California at Berkeley; M.A., University of California at Los Angeles

Ronald Andrew Madsen (1977), *Professor of Economics*, B.S., University of Illinois; M.B.A., D.B.A., Arizona State University

Joanne M. Maguire (1996), *Assistant Professor of Religious Studies*, B.A., Connecticut College; M.T.S., Harvard Divinity School; Ph.D., The University of Chicago

Albert Anthony Maisto (1977), *Bonnie E. Cone Distinguished Professor of Teaching and Coordinator, University Honors Program, and Professor of Psychology*, A.A., Mercer College; B.A., Murray State University; M.A., Ph.D., University of Alabama

Rafic Zane Makki (1984), *Professor of Electrical Engineering*, B.E., M.S., Youngstown State University; Ph.D., Tennessee Technological University

Susan Elaine Marshall (1993), *Associate Professor of Geography and Earth Sciences*, B.A., M.S., University of Delaware; Ph.D., University of Colorado at Boulder

Walter Eugene Martin (1979), *Associate Professor of Geography and Earth Sciences*, B.S., M.A., East Carolina University; Ph.D., University of Tennessee

Terrill Wayne Mayes (1967), *Associate Professor of Physics*, B.S., Western Kentucky University; M.A., Ph.D., Vanderbilt University

Carolyn Kelley Maynard (1987), *Assistant Professor of Nursing*, B.S.N., Medical College of Georgia; M.N., University of Florida; Ph.D., University of South Carolina

Billy Frank Melton (1971), *Associate Professor of Physics*, B.S., Ph.D., Oklahoma State University

Jeffrey Frederick Meyer (1973), *Professor of Religious Studies*, B.A., Duns Scotus College; M.A., University of Dayton; M.A., Ph.D., University of Chicago

Ralph A. Meyer, Jr. (1990), *Adjunct Professor of Biology*, B.S., Ph.D., University of Maryland

Zbigniew Michalewicz (1987), *Professor of Computer Science*, M.Sc., Technical University of Warsaw; Ph.D., Polish Academy of Sciences

Roslyn Arlin Mickelson (1985), *Professor of Sociology and Adjunct Associate Professor of Women's Studies*, B.A., M.A., Ph.D., University of California at Los Angeles

Ellen Marie Miller (1982), *Assistant Professor of Economics*, B.S., Boston University; M.A., Ph.D., University of Florida

Martha LaFollette Miller (1976), *Professor of Spanish and Adjunct Professor of Women's Studies*, B.A., Smith College; M.A., University of Wisconsin; Ph.D., Washington University

Seyed Mehdi Miri (1987), *Associate Professor of Electrical Engineering*, B.S., Western Michigan University; M.S., Ph.D., Ohio State University

Hassan Modaress-Razavi (1980), *Associate Professor of Computer Science*, B.S., M.S., Ph.D., West Virginia University

Ganesh Prasad Mohanty (1972), *Bonnie E. Cone Distinguished Professor of Teaching and Professor of Engineering Science*, B.Sc., Utkal University; M.S, Michigan Technological University; Ph.D., Illinois Institute of Technology

Stanislav A. Molchanov (1994), *Professor of Mathematics*, D.Sc., Moscow State University

Linda Aderholdt Moore (1985), *Associate Professor of Nursing*, B.S.N., Duke University; M.S.N., Ed.D, University of Virginia

Tyrel Gilce Moore (1982), *Associate Professor of Geography and Earth Sciences*, B.S., Western Kentucky University; M.S., Ph.D., University of Tennessee

Margaret Patricia Morgan (1987), *Assistant Dean of Graduate Studies, Associate Professor of English*, B.A., Kean College; M.A., University of Maryland; Ph.D., Purdue University

Dan Lincoln Morrill (1963), *Professor of History*, B.A., Wake Forest College; M.A., Ph.D., Emory University

Deana F. Morrow (1998), *Assistant Professor of Social Work*, B.A., Catawba College; M.S.W., University of Georgia; M.A. Ed., Western Carolina University; Ph.D., North Carolina State University

Edward Morse (1999), *Professor of Mechanical Engineering*, B.S., Swarthmore College; M.E., Ph.D., Cornell University

Anita West Moss (1977), *Professor of English*, B.A., Lambuth College; M.A., Memphis State University; Ph.D., Indiana University

Mohammad Taghi Mostafavi (1986), *Associate Professor of Computer Science*, B.S., M.S., Ph.D., Oklahoma State University

Patrick J. Moyer (1996), *Assistant Professor of Physics*, B.S., Moravian College; M.S., Saint Bonaventure University; Ph.D., North Carolina State University

Edgar Gray Munday (1987), *Associate Professor of Mechanical Engineering*, B.S., M.S., Clemson University; Ph.D., Virginia Polytechnic Insitute and State University; P.E.

Robert John Mundt (1972), *Associate Vice Chancellor for Graduate Programs and Dean of the Graduate School*, A.B., University of South Dakota; M.A., Ph.D., Stanford University

John M. Nagle (1993), *Professor of Education, Department of Educational Administration, Research, and Technology*, B.A., Hamilton College; M.A.T., Harvard University; Ph.D., University of Pittsburgh

Sylvia C. Nassar-McMillan (1996), *Assistant Professor of Education, Department of Counseling, Special Education, and Child Development*, B.A., Oakland University; M.A., Eastern Michigan University; Ph.D., University of North Carolina at Greensboro

Jane Bryant Neese (1994), *Associate Professor of Nursing*, B.S.N., University of South Carolina at Columbia; M.S., University of Maryland at Baltimore; Ph.D., University of Virginia

Daniel A. Nelson (1994), *Adjunct Associate Professor of Biology*, B.S., University of Wisconsin; Ph.D., Florida State University

John Arthur Nelson (1976), *Associate Professor of Architecture*, B.Arch., M.Arch., Kent State University

Catherine Conwell Nesbit (1983), *Associate Professor of Education, Department of Reading and Elementary Education*, B.A., University of Iowa at Iowa City; M.Ed., University of North Carolina at Charlotte; Ph.D., Ohio State University at Columbus

Anne Mabe Newman (1981), *Associate Professor of Nursing and Adjunct Assistant Professor of Women's Studies*, B.S.N., University of North Carolina at Charlotte; M.S.N., University of North Carolina at Chapel Hill; D.S.N., University of Alabama at Birmingham

William D. Nichols (1997), *Assistant Professor of Education*, B.S., M.A., Appalachian State University; Ph.D., Texas A & M University

Marie-Therese Noiset (1986), *Associate Professor of French*, B.A., Institut du Parnasse; M.A., Trinity College, Ph.D., University of Connecticut

Bennie Harold Nunnally, Jr. (1979), *Professor of Finance*, B.A., Virginia Union University; M.B.A., Atlanta University; D.B.A., University of Virginia

Craig Alan Ogle (1984), *Professor of Chemistry*, B.S., Otterbein College; Ph.D., University of Arizona

Hae-Soo Oh (1984), *Professor of Mathematics*, B.S., M.S., Kyungpook National University; Ph.D., University of Michigan

Tanure Ojaide (1990), *Professor of African-American and African Studies*, B.A., University of Ibadan; M.A., Ph.D., Syracuse University

James David Oliver (1974), *Bonnie E. Cone Distinguished Professor of Teaching, and Professor of Biology*, B.S., University of Arizona; Ph.D., Georgetown University

Alexander Spero Papodopoulos (1978), *Professor of Mathematics*, B.S., M.S., University of Rhode Island; M.S., Ph.D., Virginia Polytechnic Institute and State University

William Macfarlane Park (1972), *Associate Professor of German*, M.A., University of Edinburgh; Ph.D., University of Colorado

Jeffrey Passe (1986), *Professor of Education, Department of Reading and Elementary Education*, B.A., State University of New York at Albany; M.Ed., Ph.D., University of Florida

John Arvle Patten (1984), *Professor of Engineering Technology*, B.M.E., General Motors Institute; M.S.M.E., Oakland University; Ph.D., North Carolina State University

Steven Robert Patterson (1993), *United Dominion Industries Distinguished Professor of Precision Engineering*, B.S., California Institute of Technology; M.S., Ph.D., University of California at Davis

James Peacock (1996), *Assistant Professor of Sociology/Gerontology*, B.Phil., M.G.S., Miami University; M.A., Ph.D., The University of Akron

Craig L. Pearce (1996), *Assistant Professor of Management*, B.S., Pennsylvania State University; M.B.A., University of Wisconsin; Ph.D., University of Maryland

Richard Dennis Peindl (1985), *Associate Professor of Mechanical Engineering*, B.S., Case Institute of Technology; M.S., Ph.D., Ohio State University

Malin Walther Pereira (1992), *Associate Professor of English*, B.A., M.A., Ph.D., University of Wisconsin-Madison

Theresa R. Perez (1998), *Professor of Education, Department of Middle, Secondary and K-12 Education*, B.A., M.A., California State University, Fresno; Ph.D., Stanford University

Monica Perry (1997), *Assistant Professor of Marketing*, B.S., College of William and Mary; M.B.A., Pennsylvania State University; Ph.D., University of Maryland

Susan Elizabeth Peters (1979), *Associate Professor of Biology*, B.S., M.S., Northern Arizona University; Ph.D., University of California at Davis

Douglas Howard Phillips (1995), *Professor of Electrical Engineering*, B.S., Oklahoma State University; M.A., University of Oklahoma; Ph.D., University of New Mexico

John Alfred Piel (1988), *Associate Professor of Education, Department of Reading and Elementary Education*, B.A., M.A., University of Northern Colorado; Ph.D., Florida State University

Mark C. Pizzato (1997), *Assistant Professor of Theatre*, B.A., University of Notre Dame; M.F.A., Catholic University of America; Ph.D., University of Wisconsin - Milwaukee

Donald Anthony Plath (1987), *Associate Professor of Finance*, B A., M.B.A., D.B.A., Kent State University

Jordan C. Poler (1995), *Assistant Professor of Chemistry*, B.S., State University of New York at Brockport; Ph.D., University of North Carolina at Chapel Hill

Philip R. Popple (1999), *Professor of Social Work*, B.S., North Texas State University; M.S.W., George Warren Brown School of Social Work, Washington University; Ph.D., Graduate School of Arts and Sciences, Washington University

Phyllis B. Post (1989), *Professor of Education, Department of Counseling, Special Education, and Child Development*, A.B., University of North Carolina at Chapel Hill; M.Ed., University of North Carolina at Charlotte; Ph.D., University of Wisconsin

Jeffrey Wallace Price (1992), *Associate Professor of Music*, B.M., M.M., University of North Carolina at Greensboro; D.M., Florida State University

David K. Pugalee (1997), *Assistant Professor of Education, Department of Middle, Secondary and K-12 Education*, B.S., Lee College; M.Ed., University of Southern Mississippi; M.S., North Carolina Central University; Ph.D., University of North Carolina at Chapel Hill

Gerald Frederic Pyle (1980), *Professor of Health Promotions and Kinesiology*, B.A., Kent State University; M.A., Ph.D., University of Chicago

James Allen Queen (1992), *Chair, Department of Educational Administration, Research and Technology, and Professor of Education*, B.S.Ed., M.A.Ed., Western Carolina University; Ed.D., University of Virginia

Joseph Edward Quinn (1971), *Professor of Computer Science*, B.S., University of Dayton; Ph.D., Michigan State University

Daniel Rabinovich (1996), *Assistant Professor of Chemistry*, B.S., Catholic University; M.A., M.Phil, Columbia University (Lima, Peru); Ph.D., Columbia University (Lima, Peru)

Jayaraman Raja (1989), *Professor of Mechanical Engineering*, B.E., M.Sc., University of Madras; Ph.D., Indian Institute of Technology

Mohammad Yasin Akhtar Raja (1990), *Associate Professor of Physics*, B.A., Punjab University; M.S., M.A., University of Islamabad; Ph.D., University of New Mexico

Warren K. Ramp (1992), *Adjunct Professor of Biology*, B.S., State University of New York at Oneonta; M.S., Colorado State University; Ph.D., University of Kentucky

Zbigniew Weislaw Ras (1981), *Professor of Computer Science*, M.A., Ph.D., Warsaw University

Lisa Slattery Rashotte, (1998), *Assistant Professor of Sociology*, B.A., Florida State University; M.A., Ph.D., University of Arizona

Gary Raymond Rassel (1982), *Associate Professor of Political Science*, B.S., South Dakota State University; M.A., University of South Dakota; M.A., Ph.D., Michigan State University

John C. Reeves (1996), *Blumenthal Professor of Judaic Studies and Associate Professor of Religious Studies*, B.A., University of North Carolina at Chapel Hill; M.Div., Southeastern Seminary, Wake Forest; M.Phil., Ph.D., Hebrew Union College-Jewish Institute of Religion

Kathleen Joan Reichs (1983), *Professor of Anthropology*, B.A., American University; M.A., Ph.D., Northwestern University

Robert Charles Reimer (1971), *Professor of German*, B.A., University of Wisconsin; M.A., Ph.D., University of Kansas

Harold Braun Reiter (1972), *Associate Professor of Mathematics*, B.S., Louisiana State University; M.S., Ph.D., Clemson University

Gyorgy E. Revesz (1991), *Professor of Computer Science*, B.S., Ph.D., Eotvos University of Budapest

Thomas Leonard Reynolds (1982), *Associate Dean of Graduate Programs, and Professor of Biology*, B.A., M.A., California State University; Ph.D., Ohio State University

J. Lyn Rhoden (1995), *Clinical Assistant Professor and Project Coordinator, Counseling, Special Education and Child Development*, B.A., Stetson University; M.H.D.L., University of North Carolina at Charlotte; Ph.D., University of North Carolina at Greensboro

Terrel Lee Rhodes (1980), *Associate Professor of Political Science*, B.A., Indiana University; M.A., Ph.D., University of North Carolina at Chapel Hill

Esther G. Richey (1997), *Assistant Professor of English*, B.A., University of California, Irvine; M.A., University of Hawaii at Manoa; Ph.D., University of California, Los Angeles

Robert J. Rickelman (1991), *Associate Professor of Education, Department of Reading and Elementary Education*, B.A., M.Ed., Ohio University; Ph.D., University of Georgia

John Marcus Risley (1988), *Associate Professor of Chemistry*, B.S., Ball State University; Ph.D., Purdue University

Stephanie S. Robbins (1981), *Associate Professor of Information and Operations Management*, A.A., Lasell Junior College; B A., Emerson College; M.Ed., Memphis State University; Ph.D., University of Alabama; Ph.D., Louisiana State University

Bryan Eugene Robinson (1977), *Professor of Education, Department of Counseling, Special Education, and Child Development*, B.A., East Carolina University; M.Ed., University of North Carolina at Charlotte; Ph.D., University of North Carolina at Greensboro

James Lee Robinson (1996), *Faculty Associate, Computer Science*, B.S., University of North Carolina at Charlotte

Russell Gene Rose (1969), *Associate Professor of French*, B.A., Wilmington College; M.A., Ph.D., University of Kentucky

Franz Rothe (1989), *Associate Professor of Mathematics*, B.A., Universitat Fridericiana; M.A., Eidgenossiche Technishe Hochschule; Ph.D., Universitat zu Tubingen

Bobbie Haynes Rowland (1969), *Professor of Education, Department of Counseling, Special Education, and Child Development*, A.B., M.S., Ph.D., University of North Carolina at Greensboro

David Calvin Royster (1982), *Associate Professor of Mathematics*, B.A., University of the South; Ph.D., Louisiana State University

Blair A. Rudes (1999), *Assistant Professor of English*, B.A., M.A., Ph.D., State University of New York at Buffalo

Dorothy Smith Ruiz (1992), *Associate Professor of African-American and African Studies*, B.A., Fort Valley State College; M.A., Ph.D., Michigan State University at East Lansing

Roger Russi (1996), *Assistant Professor of German*, A.A., Corning Community College; B.A., M.A., State University of New York; Ph.D., University of North Carolina at Chapel Hill

Benjamin Russo (1984), *Associate Professor of Economics*, B.A., State University of New York at Stony Brook; M.A., Ph.D., University of Iowa

Deborah Elaine Ryan (1985), *Associate Professor of Architecture and Adjunct Assistant Professor of Women's Studies*, B.L.Arch., North Carolina State University at Raleigh; M.L.Arch., Harvard University

Steven O. Sabol (1998), *Assistant Professor of History*, B.A., Elon College; M.A., Old Dominion University; Ph.D., Georgia State University

Adalira Saenz-Ludlow (1995), *Assistant Professor of Mathematics*, B.S., Universidad Pedagogica Nacional; M.S., State University of New York at Fredonia; Ed.D, University of Georgia

Edward Byron St. Clair (1970), *Chair, Department of Religious Studies, Associate Professor of Religious Studies*, B.A., George Washington University; B.D., Southeastern Seminary; Ph.D., Duke University

Robert Morrison Sandarg (1984), *Associate Professor of French*, B.A., M.A., Ph.D., University of North Carolina at Chapel Hill

Eric John Sauda (1977), *Associate Professor of Architecture*, A.B., Princeton University; M.Arch, University of California at Los Angeles

Cem Ali Saydam (1986), *Chair, Department of Information Operations Management, and Professor of Information and Operations Management*, B.S., Bogazici University; Ph.D., Clemson University

Eugene Carl Schaffer (1976), *Chair, Department of Middle, Secondary, and K-12 Education, and Professor of Education*, B.A., M.Ed., Ed.D., Temple University

Teresa L. Scheid (1990), *Associate Professor of Sociology*, B.A., Heidelberg College; M.S., Texas A&M University; Ph.D., North Carolina State University

Stanley Scott Schneider (1985), *Professor of Biology*, B.S., M.S., Southwest Texas University; Ph.D., University of California at Davis

Nancy Schoeps (1980), *Senior Lecturer in Mathematics*, B.A., Drew University; Ph.D., Syracuse University

Richard G. Schroeder (1991), *Professor of Accounting*, B.Ed., Chicago Teachers College; M.B.A., Northwestern University; D.B.A., Arizona State University

Peter Martin Schwarz (1978), *Chair, Department of Economics, and Professor of Economics*, B.S., City College of New York; M.A., Ph.D., Ohio State University

Calvin W. Sealey (1996), *Chair, Department of Finance and Business Law, and The Torrence E. Hemby, Sr. Distinguished Professor in Banking*, B.A., University of North Carolina at Asheville; M.A., Ph.D., University of Georgia

James Winford Selby (1973), *Professor of Psychology*, B.A., Tulane University; M.A., Ph.D., University of Iowa

Douglas Stuart Shafer (1978), *Professor of Mathematics*, B.S., Carson-Newman College; M.S., Ph.D., University of North Carolina at Chapel Hill

Alan T. Shao (1990), *Professor of Marketing*, B.B.A., M.B.A., Old Dominion University; Ph.D., University of Alabama

Daniel L. Shealy (1988), *Professor of English*, B.A., Newberry College; M.A., Ph.D., University of South Carolina at Columbia

James William Shelnutt (1987), *Professor of Engineering Technology*, B.M.E., General Motors Institute; M.S., Air Force Institute of Technology; P.E.

Dena Lynn Shenk (1991), *Coordinator, Gerontology Program, and Professor of Anthropology*, B.A., State University of New York at Stony Brook; M.A., Ph.D., University of Massachusetts

Barry G. Sherlock (1997), *Associate Professor of Engineering Technology*, B.S.E.E., M.S.E.E., University of Cape Town; Ph.D., Imperial College, University of London

William David Siegfried, Jr. (1976), *Director of Uptown Center, and Associate Professor of Psychology*, B.A., Trinity College; M.A., Long Island University; Ph.D., Ohio State University

Ronald Bernard Simono (1967), Director, Counseling and Health Services, and Professor of Psychology, B.S., St. Norbert College; M.S., Ph.D., University of Wisconsin

Hoyle Mitchel Simpson (1982), *Associate Professor of Physics*, B.A., Pfeiffer College; Ph.D., Clemson University

Wade Napoleon Sisk (1993), *Assistant Professor of Chemistry*, B.S., University of Iowa; Ph.D., University of California at Berkeley

John Smail (1988), *Chair, Department of History, and Professor of History*, B.A., University of Wisconsin at Madison; M.A., Ph.D., Stanford University

Frederik Northrop Smith (1984), *Professor of English*, B.S., Loyola College; M.A., Ph.D., University of Virginia

M. Dwayne Smith (1994), *Chair, Department of Sociology, Anthropology, and Social Work, and Professor of Sociology*, B.S., M.A., University of Houston; Ph.D., Duke University

Jane Diane Smith (1999), Professor of Counseling, Special Education and Child Development, B.S., The Pennsylvania State University; M.Ed., University of Pittsburgh; Ph.D., Vanderbilt University

Michael A. Smith (1999), *Assistant Professor of Information and Operations Management, and Assistant Professor of Information Technology*, B.S., M.S., Ph.D., Georgia Institute of Technology

Scott Smith (1997), *Professor of Mechanical Engineering and Engineering Science*, B.S.M.E., Tennessee Technological University; M.S., Ph.D., University of Florida

Stuart Thomas Smith (1994), *Associate Professor of Mechanical Engineering and Engineering Science*, B.S., Dunstable College; Ph.D., University of Warwick

John Willis Sommer (1993), *Knight Distinguished Professor of Public Policy, Professor of Geography, and Professor of Political Science*, A.B., Dartmouth College; A.M., Ph.D., Boston University

Isaac M. Sonin (1991), *Professor of Mathematics*, M.S., Ph.D., Moscow State University

Gail Sorenson (1992), *Professor of Education, Department of Educational Administration, Research, and Technology*, B.S., Kent State University; J.D., Western New England College; Ed.D., University of Massachusetts at Amherst

Frederick Howard Spooner (1981), *Professor of Education, Department of Counseling, Special Education, and Child Development*, B.S., M.S., Butler University; Ph.D., University of Florida

Melba Cathey Spooner (1987), *Assistant Dean, College of Education, and Assistant Professor of Education, Department of Reading and Elementary Education*, A.A., Central Piedmont Community College; B.A., M.Ed., University of North Carolina at Charlotte; Ed.D., The University of North Carolina at Greensboro

Jo Ann Springs (1987), *Lecturer in Education, Department of Counseling, Special Education, and Child Development*, B.A., North Carolina Central University; M.H.D.L., University of North Carolina at Charlotte

Alan Thomas Stadler (1996), *Assistant Professor of Civil Engineering*, B.S.C.E., M.S.C.E., The Ohio State University; Ph.D., The University of Colorado at Boulder

Margaret Stanley-Hagan (1989), *Chair, Department of Psychology, and Associate Professor of Psychology*, B.A., University of North Carolina at Charlotte; M.A., Ph.D., University of Virginia

Gregory Steven Starrett (1992), *Associate Professor of Anthropology*, B.A., Northwestern University; M.A., Ph.D. Stanford University

Nickolas Mark Stavrakas (1973), *Professor of Mathematics*, B.S., University of North Carolina at Charlotte; M.S., Ph.D., Clemson University

Todd Robert Steck (1991), *Associate Professor of Biology*, B.S., Allegheny College; M.S., Ph.D., University of Rochester

Linda L. Steele (1998), *Assistant Professor of Nursing*, B.S.N., M.S.N., Southern Illinois University; Ph.D., University of Texas

Katherine Suzanne Stephenson (1986), *Associate Professor of French and Adjunct Associate Professor of Women's Studies*, B.A., Texas Christian University; M A., Ph.D., University of North Carolina at Chapel Hill

Thomas Howard Stevenson (1976), *Cullen Professor of Marketing*, B.S.B.A., M.B.A., Syracuse University; Ph.D., Case Western Reserve University

Alfred Wright Stuart (1969), *Professor of Geography and Earth Sciences*, B.S., University of South Carolina; M.S., Emory University; Ph.D., Ohio State University

Anthony C. Stylianou (1990), *Associate Professor of Information and Operations Management*, B.A., M.B.A., Ph.D., Kent State University

Kalpathi Raman Subramanian (1993), *Associate Professor of Computer Science*, B.E., University of Madras; M.S., Ph.D., University of Texas at Austin

Yanqing Sun (1994), *Associate Professor of Mathematics*, B.S., Wuhan University of Technology; M.S., Huazhong University of Science and Technology; M.S., Ph.D., Florida State University

Rajeshwari Sundaram (1999), *Assistant Professor of Mathematics*, B.Sc., Calcutta University; M.Sc., Indian Statistical Institute; Ph.D., Michigan State University

Randy Stuart Swanson (1989), *Associate Professor of Architecture*, B.Arch., M.Arch., University of Illinois at Urbana, M.S.Arch., Ph.D., University of Pennsylvania

Linda Eggeman Swayne (1981), *Chair, Department of Marketing, and Professor of Marketing*, B.B.A., M.B.A., Stetson University; Ph.D., North Texas State University

Michael Thomas Swisher (1988), *Associate Professor of Architecture*, A.B., Washington University; M.F.A., Massachusetts College of Art

James Daniel Tabor (1989), *Professor of Religious Studies*, B.A., Abilene Christian University; M.A., Pepperdine University; Ph.D., University of Chicago

Richard Glenn Tedeschi (1976), *Associate Professor of Psychology*, B.A., Syracuse University; Ph.D., Ohio University

Debra F. Terrell (1997), *Assistant Professor of Psychology*, B.S., Mercer University; M.S., Ph.D., University of Georgia

William Scott Terry (1976), *Professor of Psychology*, B.A., Fairfield University; M.S., Ph.D., Yale University

David Wesley Test (1983), *Professor of Education, Department of Counseling, Special Education, and Child Development*, B.A., Eisenhower College; M.A., Ph.D., Ohio State University

David J. Thaddeus (1999), *Professor of Architecture*, B.A., American University, M.Arch., University of Houston

Ralf Thiede (1990), *Associate Professor of English,* M.A., Wilhelms Universitat; M.A., Ph.D., University of Missouri

Herman Edward Thomas (1974), *Professor of Religious Studies,* B.S., North Carolina A & T State University; B.D., Th.M., Duke University; Ph.D., Hartford Seminary Foundation

Carolyn R. Thompson (1991), *Associate Professor of Political Science,* B.A., Emmanuel College; M.S.W., Saint Louis University; Ph.D., The Johns Hopkins University

Heather A. Thompson (1997), *Assistant Professor of History,* B.A., M.A., University of Michigan; Ph.D., Princeton University

Mano Thubrikar (1991), *Adjunct Professor of Biomedical Engineering,* B.E., Nagpur University; M.S., Ph.D., New York University

Lynne Tingle (1998), Professor of Health Promotion and Kinesiology, B.S., University of North Carolina at Greensboro; M. Ed., University of North Carolina at Charlotte, Ph.D., University of Toledo

Ram Chandra Tiwari (1986), *Chair, Department of Mathematics, and Professor of Mathematics,* B.Sc., M.Sc., Allahabad University; M.S., Ph.D., Florida State University

William J. Tolone (1996), *Assistant Professor of Computer Science,* B.S., Millikin University; Ph.D., University of Illinois at Urbana-Champaign

Ignatius Joseph Toner (1973), *Professor of Psychology,* A.B., University of Scranton; M.S., Ph.D., University of Wisconsin

Rosemarie Tong (1999), *Mecklenburg County Medical Society Distinguished Professor of Health Care Ethics, and Professor of Philosophy,* B.A., Marygrove College; M.A., Catholic University; Ph.D., Temple University

Susan R. Trammell (1996), *Assistant Professor of Physics,* B.S., University of North Carolina at Chapel Hill; M.A., Ph.D., University of Texas

Farid Michel Tranjan (1985), *Chair, Department of Electrical and Computer Engineering, and Professor of Electrical Engineering,* B.S., Centenary College of Louisiana; M.S., Ph.D., University of Kentucky

Denise M. Trauth (1993), *Provost and Vice Chancellor for Academic Affairs, and Professor of Communication Studies,* B.A., College of Mount St. Joseph; M.A., Ohio State University; Ph.D., University of Iowa

Louis Alfred Trosch (1969), *Professor of Business Law,* B.A., Bethany College; M.A., George Washington University; J.D., West Virginia University

Jennifer Troyer (1999), *Professor of Economics,* B.B.A., University of Memphis; M.S., University of Tallahassee; Ph.D., Florida State University

Raphael Tsu (1988), *Distinguished Professor of Electrical Engineering,* B.S., University of Dayton; M.S., Ph.D., Ohio State University

Irvin Burchard Tucker III (1981), *Associate Professor of Economics,* B.S., North Carolina State University at Raleigh; M.A., Ph.D., University of South Carolina

Michael J. Turner (1998), *Assistant Professor of Health Promotion and Kinesiology,* B.S., M.S., Miami University; Ph.D., University of Tennessee

Robert Tyson (1999), *Professor of Physics,* B.S, Pennsylvania State University; M.S., West Virgina University; Ph.D., West Virginia University

Pamela Unwin-Barkley (1998), *Assistant Professor of Architecture,* B.Arch., University of Kentucky; M.Arch, Cornell University

Boris Rufimovich Vainberg (1992), *Professor of Mathematics,* M.Sc., D.Sc., Moscow State University

Lori Beth Van Wallendael (1986), *Associate Professor of Psychology,* B.A., MacMurray College; M.A., Ph.D., Northwestern University

Christine Wallgren Vance (1974), *Associate Professor of French,* C.E.L.G., Universite de Paris et Lille; Licence-es-Lettres, Universite d' Alger-Aix-en-Provence; Licence-es-Lettres, Universite de Paris-Sorbonne; M.A., Ph.D., Vanderbilt University

Robert Everett Vermillion (1965), *Professor of Physics,* A.B., King College; M.S., Ph.D., Vanderbilt University

Eugene P. Wagner, II (1997), *Assistant Professor of Chemistry,* B.S., M.S., Illinois State University; Ph.D., University of Florida

Wayne A. Walcott (1970), *Associate Provost, and Associate Professor of Geography,* B.S., Western Michigan University; M.A., Ph.D., University of Illinois at Urbana-Champaign

Stuart Tjip Walker (1996), *Assistant Professor of Political Science,* B.A., Wesleyan University; M.P.A., Harvard University; Ph.D., Indiana University

Josephine Davis Wallace (1991), *Director, Mathematics and Science Education Center, Associate Professor of Education, Department of Reading and Elementary Education,* B.S., M.A., East Carolina University; Ph.D., University of North Carolina at Chapel Hill

James I. Walsh (1997), *Assistant Professor of Political Science,* B.A., Trinity College; Ph.D., American University

Thomas David Walsh (1970), *Associate Professor of Chemistry*, A.B., University of Notre Dame; Ph.D., University of California at Berkeley

David Russell Ian Walters (1990), *Professor of Architecture*, B.Arch, M.Arch., University of Newcastle-upon-Tyne

Sheng-Guo Wang (1997), *Associate Professor of Engineering Technology*, B.S., M.S., University of Science and Technology of China; Ph.D., University of Houston

Diane Waryold (1999), Assistant Professor of Special Education; B.S., State University College at Cortland; M. Ed., University of Florida; Ph. D., Florida State University

Samuel Dibble Watson, Jr. (1973), *Professor of English*, B.A., Wofford College; M.A., University of Virginia; Ph.D., University of Iowa

Coral Barborie Wayland (1998), *Assistant Professor of Anthropology*, B.A., University of Florida; Ph.D., University of Pittsburgh

Murray Alexander Webster (1993), *Professor of Sociology*, A.B., M.A., Ph.D., Stanford University

Barnet M. Weinstock (1977), *Professor of Mathematics*, A.B., Columbia College; Ph.D., Massachusetts Institute of Technology

Thomas Paul Weldon (1995), *Assistant Professor of Electrical Engineering*, B.S., M.S., Ph.D., Pennsylvania State University

Betsy West (1998), *Assistant Professor of Architecture*, B.Arch., North Carolina State University; M.Arch, Yale University

Mark Irwin West (1984), *Professor of English*, B.A., Franconia College; M.E.A.S., University of Wisconsin-Green Bay; Ph.D., Bowling Green State University

James Daniel White, Jr. (1971), *Associate Professor of Religious Studies*, B.A., Campbell College; Ph.D., University of Pennsylvania

Richard Bert White (1983), *Professor of Education, Department of Counseling, Special Education, and Child Development*, B.A., Miami University; M.S.Ed., Ed.D., Indiana University

Joseph Martin Whitmeyer (1993), *Associate Professor of Sociology*, B.S., Wright State University; M.A., Ph.D., University of Washington

Gregory Alan Wickliff (1991), *Associate Professor of English*, B.A., Miami University; M.A., Ph.D., Purdue University

Volker Wihstutz (1987), *Professor of Mathematics*, Diploma, University of Frankfort; Ph.D., University of Bremen

Robert Gerald Wilhelm (1993), *Associate Professor of Mechanical Engineering*, B.S., Wichita State University; M.S., Purdue University; Ph.D., University of Illinois at Urbana-Champaign

Anthony Barry Wilkinson (1987), *Professor of Computer Science*, B.Sc., University of Salford; M.Sc., Ph.D., University of Manchester

Margaret C. Wilmoth (1996), *Associate Professor of Adult Health Nursing*, B.S.N., M.S., University of Maryland; Ph.D., University of Pennsylvania

Susan J. Winter (1999), *Assistant Professor of Information and Operations Management, and Assistant Professor of Information Technology*, B.A., University of California at Berkeley; M.A., Claremont Graduate School; Ph.D., University of Arizona

Peter Lee Wong (1988), *Associate Professor of Architecture*, B.A., University of Washington; M.Arch, University of Pennsylvania

Karen Dutson Wood (1985), *Professor of Education, Department of Reading and Elementary Education*, B.A., Catawba College; M.A., Ed.S, Appalachian State University; Ph.D., University of Georgia

Wendy M. Wood (1994), *Assistant Professor of Education, Department of Counseling, Special Education, and Child Development*, B.A., Lynchburg College; M.Ed., Ph.D., Virginia Commonwealth University

Jy Shing Wu (1980), *Professor of Civil Engineering*, B.S., National Taiwan University; M.S., Asian Institute of Technology; Ph.D., Rutgers, The State University

Wei-Ning Xiang (1990), *Associate Professor of Geography and Earth Science*, B.S., Beijing Normal University; M.R.P., University of Massachusetts; Ph.D., University of California at Berkeley

Jing Xiao (1990), *Associate Professor of Computer Science*, B.S., Beijing Normal University; M.A., Ph.D., University of Michigan

Maria Grace Yon (1987), *Associate Professor of Education, Department of Reading and Elementary Education, and Adjunct Professor of Women's Studies*, B.S., Concord College; M.A., West Virginia University; Ed.D., Virginia Polytechnic Institute and State University

David Thomas Young (1985), *Chair, Department of Civil Engineering, and Associate Professor of Civil Engineering*, B.S.C.E., M.S.C.E., Clemson University; Ph.D., Virginia Polytechnic Institute and State Univesity

Alexander Yushkevich (1990), *Professor of Mathematics*, B.A., Ph.D., Moscow University; D.E., Dzerzhinsky Military Academy

Diane Lee Zablotsky (1992), *Associate Professor of Sociology*, B.S., Pennsylvania State University; M.A., State University of New York at Binghamton; Ph.D., University of Maryland

Jian X. Zhang (1996), *Visiting Assistant Professor of Biology*, M.D., Chengdu College of Sports Medicine; M.A., Springfield College; Ph.D., University of South Carolina

Zhi Yi Zhang (1990), *Associate Professor of Mathematics*, B.A., Hunter College; M.S., Ph.D., Rutgers University

Dian Zhou (1990), *Associate Professor of Electrical Engineering*, B.S., M.S., Fudan University; Ph.D., University of Illinois at Urbana-Champaign

Youlan Zhu (1990), *Professor of Mathematics*, Ph.D., Qinghua University

Richard Allen Zuber (1978), *Professor of Economics*, B.A., Wake Forest University; M.A., Ph.D., University of Kentucky

Jan M. Zytkow (1997), *Professor of Computer Science*, M.S., M.A., Ph.D., University of Warsaw

THE GRADUATE EMERITUS FACULTY

George Epstein (1985), *Professor of Computer Science Emeritus*, B.S., California Institute of Technology; M.S., University of Illinois; Ph.D., University of California at Los Angeles

E.K. Fretwell Jr. (1979), *Chancellor Emeritus and Professor of Education Emeritus*, A.B., Wesleyan University; M.A.T., Harvard University; Ph.D., Columbia University

Leon H. Gatlin, III (1966), *Associate Professor of English Emeritus*, B.A., Wake Forest College; M.A., Ph.D., University of Iowa

Richard Greene (1988), *Professor of Electrical Engineering Emeritus*, B.S., Lehigh University; Ph.D., University of Pennsylvania

Dolan Hinson (1968), *Associate Professor of Accounting Emeritus*, B.S., Pfeiffer College; M.B.A., New York University; Ph.D., University of South Carolina; C.M.A.; C.L.U., Ch.F.C.

Debra Hymovich (1993), *Associate Dean Emeritus, College of Nursing, and Professor of Nursing Emeritus*, B.S., Skidmore College; M.A., Columbia University; Ph.D., University of Maryland at College Park

Marinell Hargrove Jernigan (1972), *Chair, Department of Adult Health, and Professor Nursing Emerita*, B.S., Johns Hopkins University; M.S., Ed.D., University of Alabama

Miriam Almaguer Leiva (1966), *Bonnie E. Cone Distinguished Professor of Teaching (Mathematics) Emerita*, Guilford College; M.A., University of North Carolina at Chapel Hill; Ph.D., Union Graduate School

Gary Long (1972), *Associate Professor of Psychology Emeritus*, B.A., Wake Forest University; M.S., North Carolina State University; Ph.D., University of Waterloo

Julian Dewey Mason, Jr. (1966), *Professor of English Emeritus*, A.B., University of North Carolina at Chapel Hill; M.A., George Peabody College for Teachers; Ph.D., University of North Carolina at Chapel Hill

James Francis Matthews (1964), *Chairperson, Department of Biology, and Professor of Biology Emeritus*, A.B., Atlantic Christian College; M.S., Cornell University; Ph.D., Emory University

Michele Melaragno (1974), *Professor of Architecture Emeritus*, Liceale Classica, Collegio Nazareno; Doctor of Civil Engineering, University of Bari

Christopher Morgan (1984), *Associate Professor of Architecture Emeritus*, B.A., Oberlin College; B.Arch., University of Oregon; M.Arch, University of Idaho

David Eugene Nixon (1963), *Professor of Mathematics Emeritus*, B.S., M.S., North Carolina State College; Ph.D., North Carolina State University at Raleigh

Nelson Rudolph Nunnally (1974), *Professor of Geography and Earth Sciences Emeritus*, B.S., M.A., University of Georgia; Ph.D., University of Illinois

Edward Oberhofer (1967), *Associate Professor of Physics Emeritus*, B.S., North Carolina State College; M.S., Ph.D., North Carolina State University

Robert Douglas Snyder (1975), *Professor of Engineering Sciences Emeritus*, B.S.M.E., Indiana Institute of Technology; M.S.M.E., Clemson University, Ph.D., West Virginia University; P.E.

Al Stuart (1969), *Professor of Geography and Earth Sciences Emeritus*, B.S., University of South Carolina; M.S., Emory University; Ph.D., Ohio State University

Judith Diann Suther (1979), *Professor of French Emerita*, B.A., University of Missouri-Columbia; M.A., University of Michigan; Ph.D., University of Missouri-Columbia

Mary Beth Thomas (1980), *Professor of Biology Emerita*, B.A., Agnes Scott College; M.A., Ph.D., University of North Carolina at Chapel Hill

Jim Travis (1973), *Associate Professor of Biology Emeritus*, B.S., M.S., East Texas State College; Ph.D., Texas A & M University

Lazaros A. Varnas (1968), *Professor of English Emeritus*, Certificate, British Institute; M.A., Ph.D., University of Pennsylvania

Robert Vermillion (1965), *Professor of Physics Emeritus*, A.B., King College; M.S., Ph.D., Vanderbilt University

Thomas Walsh (1970), *Associate Professor of Chemistry Emeritus*, A.B., University of Notre Dame; Ph.D., University of California at Berkeley

George Windholz (1971), *Professor of Psychology Emeritus*, B.A., City College of New York; M.A., Ph.D., Columbia University

William David Wubben (1963), *Professor of Economics and Business Administration Emeritus*, B.Ph., M.B.A., University of Chicago; Ph.D., The Claremont Graduate School

A

Academic Integrity 21, 230
Academic Records And Transcripts 24
Academic Regulations 21-30
Accounting
  M.ACC. 31–33
  Course Descriptions 32-33
Accreditation 6
Admission to the Graduate School
  ..... see also Application Materials, 9-10
  International Students, Additional Information 12
Admission, Types of
  Deferment 10
  Full Standing 10
  Provisional Standing 10
Adult Students and Evening Services (OASES) 218
Alumni Affairs 227-228
Anthropology
  Course Descriptions 210
Appeals
  Academic 25-26
  Grades 24
  Tuition and Fees 18
Application Deadlines 10
Application for the Degree ..... *See Also Graduation Fees*, 25
Application Materials
  Domestic Students 10
  Financial Aid 18
  International Students 10, 12, 218
  Updating 11
Application Processing Fee 10, 16
Application Requirements, General
  Doctoral Programs 11
  Certificate Programs 12
  International Students 12
  Master's Programs 11-12
  Post-Baccalaureate Students 12
Application Status 10
Architecture 33–36
  Course Descriptions 33-36
  Grants 19
Assistantships 19
Athletics 224
Attendance Policy 23
Auditing A Class 22

B

Ben Craig Center 228
Biology 36–42
  M.A. 37
  M.S. 36-37
  Ph.D. 37-39
  Course Descriptions 39-42
Bookstore 226
Botanical Gardens 230
Business Administration 42–49
  MBA Plus Certificate 45-46
  Course Descriptions 46-49

C

Calendar 2
Campus Map ..... inside back cover
Campus Services 226-227
Career Center, University 221
Catalog Policies 23
  Corrections ..... inside front cover
Certificates ..... see Graduate Certificates
Chemistry, M.S. 49–53
  Course Descriptions 51-53
  Grants 19
Chimney Rock Park Field Station 229
Code of Student Academic Integrity 21, 230
Code of Student Responsibility 21, 230-231
Communication, Certificate 53–54
  Course Descriptions 53-54
Computer Science,. 54–60
  Advanced Databases and Knowledge Discovery. 55-56
  M.S. 54-55
  Course Descriptions 56-60
Computing Services 218
Continued Enrollment 24
Continuing Education, Distance Education/
  Extension, and Summer Programs 228
Continuous Registration 22
Counseling, M.A. 60–63
  Course Descriptions 61-63
Counseling Center 222
Course Load 21
Credit By Examination 25
  Credit By Examination Fee 16
Criminal Justice, M.S. 63–65
  Course Descriptions 64-65
  Grants 19

D

Dean of Students Office 222-223
Deferment Policy, Admissions 10
Degrees, Program Descriptions 31-209
  Change Of Degree Program 22
  Requirements 26-29
Dining Services 17
Directory ..... inside front cover, 234-258
Discriminatory Personal Conduct 5
Disability Services 218
Distance Education 228
Domestic Applicants 10
Dropping a Class, see also Withdrawal from the
  University 22
Dual Undergraduate/Graduate Registration 8

E

Ed.D. Requirements 28-29
  Program of Study 28
  Time Limit 28-29
Early-Entry To Graduate Programs 8
Economics, M.S. 65–68
  Course Descriptions 67-68
Education
Child And Family Studies, M.Ed. 69–72
  Course Descriptions 71-72
Curriculum and Supervision, M.Ed. 72–74
  Course Descriptions 74
Educational Administration
  M.S.A. 74-75
  Ed.D. 75-77
  Course Descriptions 77-79
Elementary Education, M.Ed. 80-81
  Course Descriptions 80-81
Instructional Systems Technology, M.Ed. 81-83
  Course Descriptions 82-83
Middle Grades and Secondary Education, M.Ed. ... 83–86
  Middle Grades Education 84-85
  Secondary Education 85
  Course Descriptions 85-86
Reading Education, M.Ed. 86-88
  Course Descriptions 87-88
Special Education, M.Ed. 88-90
  Academically or Intellectually Gifted, M.Ed. 89-90
  Special Education, Certificate 90-93
  Supported Employment and Transition, Certificate 93-94
  Course Descriptions 94-96
Teaching English as a Second Language 96-98
  Course Descriptions 97-98
Education General Course Descriptions 210-211
Emergency Loans, short term 18
Employment, Student 20, 221
Engineering
  Civil Engineering,
    M.S.E., M.S.C.E. 98-104
    Ph.D., cooperation with NC State U. 100
    Course Descriptions 100-104
  Electrical Engineering,
    M.S.E., M.S.E.E. 105-106
    Ph.D. 106-107
    Course Descriptions 107-114
  Engineering Management, M.S. 125-126
    Course Descriptions 126-127
  Mechanical Engineering, M.S.E. 114-115
    M.S.M.E. 115-117
    Ph.D. 117-120
    Course Descriptions 120-125
English
  M.A. 127-129
  English Education, M.A. 129-130
  English Language Studies, Certificate 130
  Technical/Professional Writing, Certificate 130-131
  Course Descriptions 131-135
Equal Opportunity And Affirmative Action 5
Experimental Ecological Reserve 229

F

Family Educational Rights and Privacy Act, (FERPA) 29-30
Fees
  Application 10, 16
  Credit by Examination 16
  Graduation 16
  Motor Vehicle 16
  Special Assessment 16
  Student Activity 16
Fee Payment 14
"Fighting Words" Harassment 232
Final Grade Changes 24
Finance
  Course Descriptions 211-212
Financial Aid 18-20
  Application Process 18
  Eligibility For Need Based Aid 18
  Fellowships 19
  Grants 18-19
  In-state Tuition Rate Benefit for NC Teachers 15
  Loans 18
  Renewal 18
Financial Information 14-20
  Residency Status For Tuition Purposes 14-15
Food Service ..... *see Dining Services*
Ford Federal Direct Loans 18
Foreign Language
  Course Descriptions 212
French
  Course Descriptions 212-213

G

Geography, M.A. 135-144
  Course Descriptions 140-144
German
  Course Descriptions 213
Gerontology
  Certificate 145-146
  M.A. 144-145
  Course Descriptions 146
Giles Scholarships 19
Grades, ... 23-24
  Appeals 24
  Final Grade Changes 24
  Grade Point Average 23
  Grade Reports 23
  Grading Policies 23
Graduate and Professional Student Government 9
Graduate Assistantships 19
Graduate Certificate Requirements 29

Graduate Classifications
Certificate 8
Doctoral 7
Master's 7
Post-Baccalaureate 8
Graduate Coordinators 7
Graduate Council 7
Graduate Faculty 7, 239-257
Graduate Programs 7-8, 31-209
Graduate School
Administration 7
History of 7
Graduate Student Organizations 9
Graduate Student Orientation 9
Graduation Fee 16, 25
Grants 18-20
Grievances ..... see also Appeals
Academic 26

H

Health Administration, M.H.A. 146-149
Course Descriptions 148-149
Health Center 223
Health Insurance 226
Health Promotion, M.S. 149-152
Course Descriptions 150-152
History
M.A. 153-155
Ph.D., joint with University of Aberdeen 155-156
Course Descriptions 154-155, 156
History
of the University of North Carolina 4
of the University of North Carolina at Charlotte 4
Honorary Organizations 224
Housing and Residence Life 15-17, 223
Deposit 17
Fees 15-16

I

I.D.'S 227
Illegal Use of Drugs or Alcohol Abuse 231
Immunization Requirements 232-233
Information Technology
Certificate 157
M.S. 157-158
Course Descriptions 158
Ph.D. 158-161
Course Descriptions 161-164
International Admissions 10, 12, 218
International Applicants 10
International Programs 218
Campus Programming 219
Education Abroad 219
English Language Language Training Institute 219
Faculty Development 219
International Student/Scholar Services 219
Public Service 219
Intramurals and Recreational Services
..... see also Student Activity Facilities, 224

J

Japanese
Course Descriptions 213

L

Learning Center 219
Liberal Studies, M.A. 164-166
Course Descriptions 165-166
Library 219-221
Media Services 220-221
Loans 18
Lucas, John Pauls Jr. Scholarship 19

M

Map, Campus ..... inside back cover
Master's Degree Requirements 26-27
Admission to Candidacy 26
Minimum Hours 26
Comprehensive Examination 26
Time Limits 26
Thesis 27
Mathematics
M.A. 166-169
Mathematics Education, M.A. 169-170
Ph.D., Applied. 170-171
Course Descriptions 171-177
Mathematics and Science Education Center 228
Course Descriptions
Media Services 220-221
Minority Presence General Grant Program, North Carolina 18-19
Mission Statement 5
Motor Vehicle Registration Fees 17

N

National Fellowships 19
New Graduate Student Orientation 9
Non-Resident Tuition Differential Grant 19
Non-Traditional Student Organization 224
North Carolina Graduate Grant 19
North Carolina Minority Presence General Grant Program 18-19
North Carolina Teachers In-State Tuition Benefit 15
Nursing and Health Professions
Adult Health Nursing, M.S.N. 179-180
Community Health Nursing, M.S.N. 180-181
Family Nurse Practitioner, M.S.N. 181-182
M.S.N. 178-179

Nurse Anesthesia 183-184
Nursing and Health Administration, M.S.N./M.H.A. 184-185
Psychiatric Mental Health Nursing, M.S.N. 182-183
Nursing Course Descriptions 185-189
Grants 19

O

Operations Research, Minor 189-190
Course Descriptions 190
Orientation, New Graduate Students 9
Outdoor Experiences 224

P

Ph.D. Requirements 27-28
Candidacy 28
Dissertation 28
Final Examination 28
Program Approval 27
Program of Study 27
Qualifying Examination 28
Residency 27
Time Limit 27
Parking 16, 226
Violations 16
Motor Vehicle Registration 16
Perkins Loan 18
Permits, Courses 24
Philosophy
Course Descriptions 213
Physics
M.S. 190-191
Ph.D., Interdisciplinary 191
Course Descriptions 191-193
Police and Public Safety 226
Political Science
Course Descriptions 213-214
Prerequisites (for courses) 24
Professional and Applied Ethics 228
Programs, Services and Facilities 266
Provisional Standing 11
Psychology 193
Clinical/Community, M.A. 194-195
Industrial/Organizational, M.A. 195-196
Course Descriptions 196-199
Public Administration, M.P.A. 199-204
Course Descriptions 202-204
Public Relations 228

R

Readmission 8, 24
Recycling 226
Refunds
Appeals 18
Housing 17
Tuition And Fees 17
Registration 21-22
Deadlines 21-22
Continuous Registration 22, 24
Religious Affairs 223-224
Religious Studies
Course Descriptions 214
Repeating A Graduate Course 24
Research
Course Descriptions 214-215
Research Services 221
Returned Check Policy 17
Rocky River Wildlife Refuge 230

S

Safety Services and Accident Prevention 227
Scholarships 19-20
Second Degrees 25
Sexual Harassment Prevention 231-232
Sexual Orientation 232
Social Work, M.S.W. 204-206
Sociology, M.A. 206-210
Course Descriptions 208-210
Spanish
Course Descriptions 215-216
Stone Scholarships 19
Statistics
Course Descriptions 216-217
Student Activities 224
Black Student Union 224
Student Leadership Development Programs 225
University Program Board 226
Student Activity Facilities 224-225
Student Activities Fees 17
Student Affairs and Services 222-24
Student Conduct 21, 230-233
Student Employment Office 20, 221
Student Government 9, 225
Student I.D.'S 227
Student Media 225
Student Organizations 9, 225-226
Summer Programs Academic 228

T

Termination of Enrollment 22, 25
Test Information 13-14
Transcripts 24
Transferred Credit 25
Transportation 226
Tuition and Fees 15-16
Residency Status for Tuition Purposes 14-15
Special Assessments 16
Tuition Differential Grant
Non-Resident 20

U

UNC Charlotte
Grants 19
History 4
Need Based Grants 19
UNC Charlotte Uptown 227
University Career Center 221
University Center, Bonnie Cone 222
University and the Community 227-229
University Development 229
University Regulation of Student Conduct 21, 230-233
University Writing Programs 221
Urban Institute 229

V

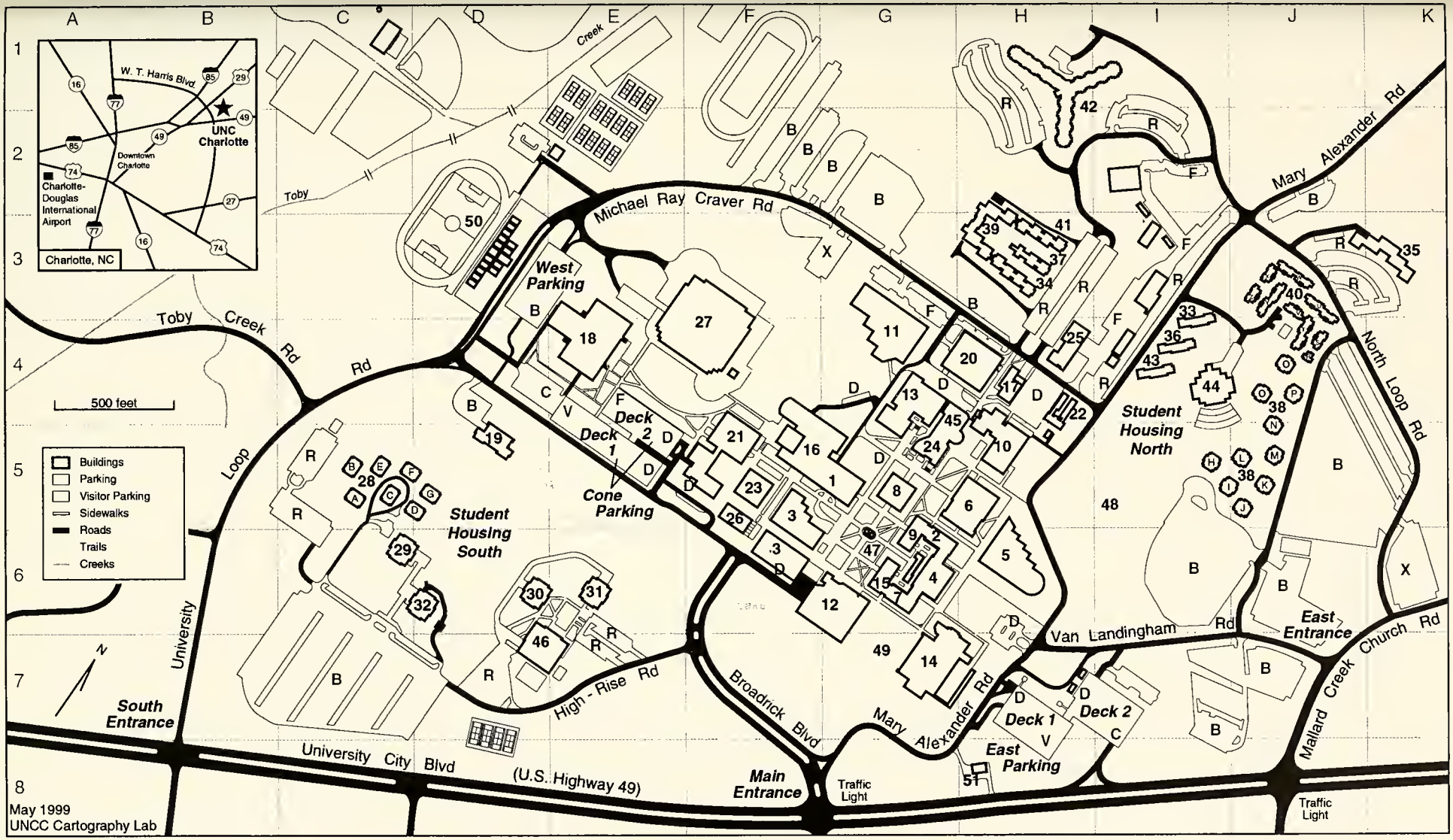
Veterans Benefits 20
Children Of Veterans 20
Vocationally Handicapped 20

W

Withdraw From The University 22
Women's Studies
Course Descriptions 217
Writing Resources Center 221-222

Z

Zonta Club (scholarship) 19



Parking

Resident	R
Commuter	C
Both Resident and Commuter	B
Faculty	F
Visitor	V
Disabled	D
Not Open	X

UNC CHARLOTTE
The University of North Carolina at Charlotte
(704) 547-2000

Academic Buildings	No.
Atkins (G5)	1
Barnard (G6)	2
Colvard (F6)	3
Denny (G6)	4
Fretwell (H6)	5
Friday (H5)	6
Garinger (G6)	7
Kennedy (G5)	8
Macy (G6)	9
McEniry (H5)	10
Burson (G4)	11
Rowe (G6)	12
Smith (G4)	13
Storrs (G7)	14
Winningham (G6)	15

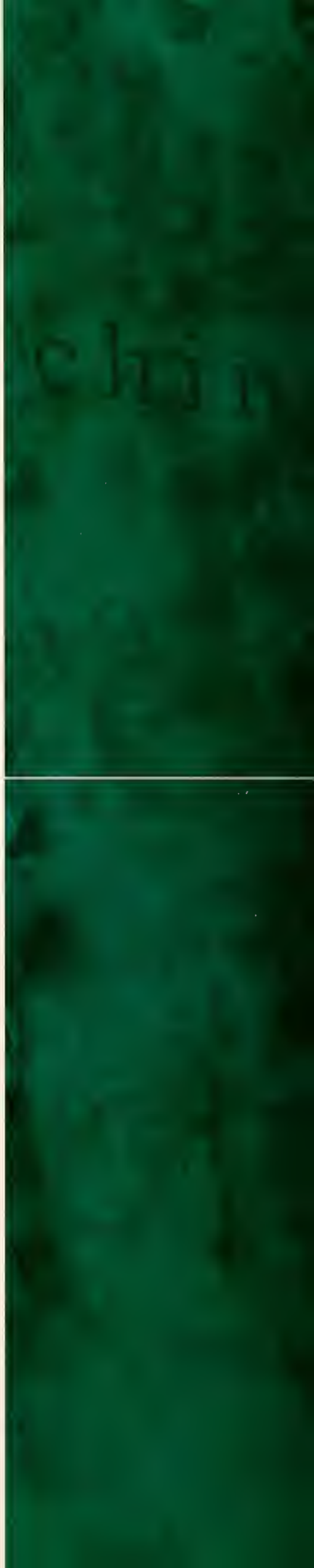
Student Support / Administration	
Atkins Library (F5)	16
Auxiliary Services (H4)	17
Belk Gymnasium (E4)	18
Brocker Health Center (D5)	19
Cameron Research Center (H4)	20
Cone Center (F5)	21
McMillan Greenhouse (H4)	22
A. K. King (F5)	23
Bookstore (G5)	24
Physical Plant (H4)	25
Reese (F5)	26
Student Activity Center (F4)	27

Student Housing South	
Hunt Village (C5)	28
Holshouser Hall (C6)	29
Moore Hall (D6)	30
Sanford Hall (E6)	31
Scott Hall (D6)	32

Student Housing North	
Cedar Hall (I4)	33
Elm Hall (H3)	34
Hawthorn Hall (K3)	35
Hickory Hall (I4)	36
Maple Hall (H3)	37
Martin Village (J5)	38
Oak Hall (H3)	39
Phase III (J3)	40
Pine Hall (H3)	41
Poplar Hall (H1)	42
Sycamore Hall (I4)	43

Dining Services	
Cafeteria/Activities Building (I4)	44
Prospector (G5)	45
Residence Dining Hall (D7)	46

Objects and Places of Interest	
Belk Tower (G6)	47
Van Landingham Glen (I5-6)	48
Sculpture Garden (G7)	49
Track and Field Complex (D3)	50
Alumni House	51



UNC CHARLOTTE

GRADUATE SCHOOL